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Journal of the Amateur Photographic Society of Madras.

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THE RECENT EXHIBITION.

The recent revival of the Fine Arts Society in Madras has proved a success and the Exhibition, which was held in the Senate House last month, is generally considered by those who remember the Exhibitions of nearly a decade ago, to have been equal to any of its predecessors. Of the photographic section, however, we regret that this cannot be said. In the open classes nearly all the prizes went to professional photographers in Madras and nearly all the good amateur work came from outside the Presidency. Just at the present time photography is at a discount in the South of India, and the numerous amateurs are apparently doing nothing worthy of exhibition. It is to be hoped that the falling off is only temporary and that now, when there is a fair prospect of annual Exhibitions being held, the members of our Society will bestir themselves and produce work more creditable to themselves than that which it was our fate to examine lately.

Of course there were some very good things, but most of the work was purely mechanical and entirely lacking in artistic quality. Even in technique there was a good deal wanting, and not a few pictures were flat and evidently printed from over-exposed negatives. But perhaps the most conspicuous defects were shown in the mounting and framing. Apparently most of the exhibitors thought that their photographs were not worth the trouble and expense of neat and suitable mounts, and the effect when a large number of them were brought together on a single screen was anything but pleasing. A number of the medals offered for competition were for sets of four photographs and it would be well in future years to stipulate that all such sets, when of whole plate or smaller size, should be mounted in a single frame. Both hanging and judging would have been simplified, and there is not the slightest doubt that the general effect of the Exhibition would have been greatly improved had this been done this year.

With not a small number of amateur photographers the interest entirely ceases when the work on the negative is completed and they are glad to call in the aid of the professional to do the printing. In India there is much to be said for this way of going about photographs, and we think it would be a good idea to award prizes for photographs from negatives taken and developed by amateurs but not necessarily printed by them. The art of photography is with the camera and in the developing room, the rest is mainly mechanical and depends more on the paper than the printer. We do not insist on a man making his own paper, and it might be well to go back a step further and allow him to send his negatives to be printed, stipulating of course that neither negatives nor prints are touched up by any one but himself. If such a class of exhibits was permitted, there would be many entries and probably many interesting pictures.

There are other suggestions one might make to increase the popularity of photography, but the present article is supposed to be a criticism of the late Exhibition and not suggestions for next year. *A nos moutons.*

In the open class there were only twenty seven exhibits—a few superlatively good, the rest mediocre. Messrs. Nicholas and Co. exhibited four bromide enlargements for which they were awarded the Silver Medal for figure subjects and an excellent enlargement of the Hon'ble Mr. H. M. Winterbotham. Messrs. Wiele and Klein's figure subjects were not altogether a success, but their bromide enlargement of the "Crowd of pilgrims in the Mahamakam Tank at Kumbakonam," which was awarded the "Gold Medal for the best photograph in the Exhibition," was undoubtedly a remarkable piece of work. Two sets of four pictures from the same firm were also extremely good, whilst the way in which they were mounted and framed was very effective and a pleasing contrast to the slovenly manner in which so many of the photographs were sent in. Messrs. Venkiah Brothers showed a fair portrait (enlarged) of the Rev. Dr. W. Miller, and Messrs. Barton Son and Co. two very good enlargements of children, for one of which they obtained a Silver Medal. The other exhibits were of the same class as those just mentioned, but there was nothing about them to call for remark. The forte of the professional in Madras is evidently enlargements, though in this branch there was one amateur at least whose work was in our opinion quite as good. We refer to a moderate enlargement by Mr. W. H. Giles entitled "A village blacksmith," which was awarded the Silver Medal for the "best photograph, any subject." It is a picture of an English smithy, not over well lit, as is usually the case. In the foreground stands the smith ready to strike a mass of iron on the anvil. The pose is natural and the man is a splendid specimen of his class. A little in the rear is the forge and in the centre a few flickering flames from the dormant fire. The scene is well chosen and the presentation as well nigh perfect as can be. It is an example of artistic work which proves that in its higher flights the productions of the camera are worthy to rank with those of the etcher and engraver. Of the same class and hardly inferior are three small photographs by Mr. G. P. Symes Pinto one of which. "In the heart of Asia," was awarded a Silver Medal. Among the sets of photographs there were some very nice pictures but not a few of the competitors spoiled their sets by the inclusion of one or more photographs of a most inferior description. The Silver Medal for figure subjects was awarded to Dr. D. Hutchinson for "Sympathy in suffering," "Rizpah daughter of Aiah," "Medical Officer to the North Sea fishing fleet" and "Sisters," all very level work. He also obtained a Bronze Medal for a set of four photographs of miscellaneous subjects of which perhaps "A study in perspective" was the best. Dr. Hutchinson is undoubtedly a photographer of high technical skill with a keen artistic eye, and it is, we think, a pity that he does not use a larger camera. Lieutenant-Colonel Sir Adelbert Talbot sent some good views of Cashmere scenery which were awarded a Silver Medal, though many would probably have preferred Mr. E. W. Stoney's sylvan pictures, which, however, were a little too hard to be quite satisfactory and were toned to a rather unpleasant purple. Surgeon-General Sibthorpe, who has comparatively recently taken to photography, sent in quite a number of good bromides, for one set of which he was awarded a Bronze Medal. We congratulate the genial head of the Medical Service in Madras on his forethought in providing himself with a hobby which will yield him much amusement and interest in his approaching retirement. The lantern slides by Mr. Stoney were excellent and well worthy of

the Silver Medal they obtained, whilst those of Mr. H. G. Tomkins were nearly as good. The latter gentleman's photographs of the moon taken with his big reflector were an interesting example of the work of an amateur astronomer and were well worthy of the recognition they obtained from the hands of the Judges.

Of the competitors who did not obtain awards Mr. Hesketh Biggs, Reka Dom, and Mr. W. G. Sloan sent in work of high merit and it is to be hoped they will be persuaded to try again. Major Youngerman, whose enlargement, "Tranquil Evening," obtained a medal, deserves special mention for his set of four pictures, though the best of them, "Belabee," was mared by a sky which illumined the shadows.

Of the exhibits not for competition Mr. Fred Dunsterville's stereoscope with 50 transparencies was undoubtedly the finest piece of photographic work in the Exhibition and as it was impossible for more than one person to see them at a time, on the crowded days at the end of the week a small charge was levied which in the aggregate brought in a considerable sum. Our late President's photographs of the solar eclipse were also shown and are well worthy to rank amongs the triumphs of celestial photography. It is to be hoped now he is away from the distractions of Madras and promoted to work on a higher plane, he will be able to show us some solar landscapes at a future Exhibition. Whilst he is getting his instruments in order we would remind him that on his lofty mountain perch there are many terrestrial scenes of great beauty, and it would be well to keep his hand in by recording them.

. . . . . A. C.

OUR HOME LETTER.

February 18th 1899.

Slow bromide papers have suddenly become fashionable, and no fewer than five different makes are now upon the English market, including the American importation Velox, which led the procession. These slow bromide papers vary considerably in speed, but most of them are printed by an exposure of several minutes to gas light, and developed by a more feeble illumination, as for instance the light of a candle. They supply in particular, the needs of the community who have not a fully equipped dark room at their disposal. With a newspaper spread on one's dining room table, a very pleasant evening can be spent by a party of friends each bringing with them two or three negatives, the host supplying a few large dishes, and the necessary amidol, or potassium oxalate.

This leads me to suggest that for a novel evening's entertainment the taking of silhouette portraits might afford much enjoyment, and amusement. The procedure is very simple. A large ground glass screen, or failing that a fine linen sheet is suspended conveniently, so that the camera can be placed upon one side of the sitter, whose shadow is thrown upon the screen by means of an optical lantern on the other. The outline of his head is photographed, developed with a strong solution, and then the new slow bromide papers might very advantageously be used for making prints. The idea is not original, I have heard of silhouette portraits being taken at bazaars.

This is the lantern slide season in Britain. Preparing slides and exhibiting them is now quite on the cards. Several proficient slide makers tell me that they have discarded uranium as a means of producing red and brown tones, preferring to arrive at the same or similar results by long exposure and slow development. Any subsequent toning has a tendency to block up the half tones, and bring on a muddy effect upon the screen. I find Mr. Alfred Stieglitz whose precept and practice in connection with photography are generally followed, holds also similar opinions. He strongly recommends the following universal developer for lantern slides, modified slightly by dilution and the addition of potassium bromide to produce warm tones. Here is his exact method :—

Water	...	20 ounces.
Hydrokinone ..	...	100 grains.
Sulphite of soda	...	400 ,,
Carbonate of soda	...	400 ,,

For cold tones, expose the plate a short time and develop with 1 part of stock solution, and 1 part of water, adding a drop or two of a ten per cent. solution of bromide of potassium. For warm tones, increase the time of exposure and use a more diluted developer, also increasing the bromide solution to 15 to 25 drops.

From the annual report of the Royal Photographic Society I gather the following particulars. 90 members have been enrolled during the year, and 16 fellows, making a total of 106. Deaths and resignations are responsible for 109, total membership at present 728. With the removal to new premises in Russell Square, a step which is to be taken very shortly, there is every probability of expansion in the work done by the Society. I am glad to hear that more stringent regulations are about to be framed relative to the admission of fellows.

The general desire for federation and organization is made apparent by several movements in the country. In Yorkshire a Union of Photographic Societies has been formed for the purpose of exchanging lecturers, providing central exhibitions, adjusting

debatable points, electing efficient judges for competetive exhibitions, and other matters too numerous to be mentioned in detail.

We have had only a small taste of winter, and before I write again in all probability young plants will be sending forth their buds. It is extraordinary that on the east coast of America, comparatively a short distance away, the cold has been extreme, and outdoor work of every kind almost entirely suspended, traffic being blocked by deep drifts of snow. The country has its particular beauties at all times and all seasons, and those who are really in earnest in the pursuit of pictorial photography do not let cold weather interfere with their operations.

PERCY LUND.
("MATTHEW SURFACE.")

PROCEEDINGS OF THE SOCIETY.

General Meeting, held at the Masonic Hall, Mount Road.

Friday, 3rd March 1899.

MR. F. DUNSTERVILLE, VICE-PRESIDENT:—*in the chair.*

NEW MEMBER.

The Hon'ble Mr. G. Stokes, proposed by Mr. F. Dunsterville, seconded by Mr. A. Chatterton, was unanimously elected a member of the Society.

PICTURES FOR THE MONTH.

Photographs of "A River Scene" were exhibited by the Elaya Raja of Travancore.

SPECIAL COMPETITION.

FIGURE SUBJECT.

Title.	Name of Competitor.	Judges' Remarks.	Award.
"FIGURE STUDY"	SURGEON-GENERAL C. SIBTHORPE, C.B., ...	Since this picture was sent in at a monthly competition it has much deteriorated, the whites are completely yellowed through the want of sufficient fixing.	
"LITTLE MISS MUFFET"	MRS. L. C. GOMPERTZ	Two pretty little pictures, but the technical results are not quite up to medal form. The cutting out and mounting require more attention.	
"AN INTERRUPTION" "BURDEN OF LIFE" "PORTRAIT STUDY" "THE EXHIBITOR"	H. H. THE ELAYA RAJAH OF TRAVANCORE ...	These are not such as we should expect from an artist of His Highness's capabilities. The first is the best, but is not good enough to merit an award.	
"SISTERS" "FISHING"	J. L. WALKER	These are the best exhibits and a Bronze Medal is awarded to "Fishing," the better of the two. These are not up to Mr. Walker's best form.	BRONZE MEDAL.

COPIES.

No. 1 No. 2	H. D. RICE	The results are flat and would probably be better on fresh Bromide Paper.	

MONTHLY COMPETITION.

Half-year ended 31st December 1898.

SURGEON-GENERAL C. SIBTHORPE, C.B. ... ... SILVER MEDAL.

(Bronze Medal not awarded.)

EXTRACTS.

Further Experiments with Formalin and Acetone in the Developer.

BY W. B. BOLTON.

DESPITE the beauty of the results obtainable with pyro-acetone, both as regards gradation and freedom from stain, as well as the rapidity of its action and its power of rendering feeble detail, it cannot be denied that the new developer presents certain disadvantages. In the first place, it offers comparatively little opportunity of modification in order to meet chance errors of exposure. For normal or correct exposure its behaviour is beyond reproach, and for "snapshots," or under circumstances where the time is necessarily cut down to the lowest, it will probably give as good a result as any other developer, except pyro-ammonia; but without resorting to the use of a separate solution of alkali, there is little chance of increasing its energy to meet exceptional circumstances. In case of over-exposure, recourse may be had to the bromide bottle, but this must be very sparingly used, or the time of development is enormously increased; or bicarbonate of soda may be added to convert the caustic alkali liberated by the acetone into normal carbonate, as I suggested a few weeks back. But, practically, it is a developer that must be made up to full strength at once, and used only with fairly accurate exposures.

Again, neither on the score of expense nor convenience of storage can it be said to compare at all favourably with most other developers, though these are, perhaps, minor points that should not be allowed to weigh against its good qualities. But with acetone at its present price, the vast majority of amateurs will hesitate before adopting its use. The large proportion of sulphite given in MM. Lumière's formula also precludes the possibility of making a very concentrated stock solution, which is another matter of some importance in the estimation of many.

My experiments were commenced with the sole object of endeavouring to give more latitude to the developer while retaining its good qualities—qualities I have not met with in any other combination; but it was not long before the conviction forced itself upon me that it could be modified with advantage in the other direction mentioned. Further than this, any lingering idea that the peculiar effects of this developer are due to a specific action of the acetone as such was entirely dissipated and its actual principle made tolerably clear. In fact, if we analyse MM. Lumière's formula, every feature of the acetone-pyro developer is readily explicable without any necessity for bringing in the acetone, except so far as it is the means of starting development.

Thus, in the first place, a one per cent. solution of pyro, *i.e.*, practically 5 gr. to the oz., is nearly double the strength ordinarily employed, and would appear to be necessary in order to counteract a tendency to want of density arising from the rapidity of development. The freedom from stain may be explained partly by that same rapidity of action, but chiefly, and, of course, in combination with it, by the very large proportion of sulphite of soda present in a more than usual "stain-preventing" form. The ordinary proportions in which sulphite is employed with pyro are four to one, but the Lumière formula contains five times as much anhydrous sulphite, which is of exactly double the value of the ordinary crystals. I have never met with anhydrous sulphite as an article of commerce in this country, or, if I have, have quietly accepted and used it in place of the usual article containing seven equivalents of water of crystallisation; but it is apparently obtainable in France, and is recommended by MM. Lumière.

Its use is, of course, equivalent to the employment of 10 grains of ordinary sulphite to each grain of pyro, a proportion which, in combination with quick development, would, I think, give a stainless film under nearly any circumstances. But it must also be remembered that the sulphite is present, not in its neutral form, but as bisulphite, in combination with acetone, in which state, although it has been deprived of its restraining action on development, it still appears capable of exercising its full power in preventing discolouration of the gelatine. The anhydrous salt is, in fact, nearly equal in value, so far as its SO_2 is concerned, to metabisulphite of potash, and the formula referred to contains, in the form of bisulphite of soda, what is equivalent to about 22·5 gr. of the potash salt in each ounce. Again I say, the quantity is sufficient to prevent stains under any circumstances.

But though I have thus explained the absence of staining, it might be assumed that the presence of so large a quantity of sulphite in any form would result in slow development. But here I would point out that the same reaction that forms the acetone-bisulphite compound liberates a very large quantity of caustic soda, large, that is to say, in proportion to the quantities ordinarily employed for developing purposes. In the particular formula under notice, the quantity of active alkali—sodium hydrate—set free in each ounce amounts to about 8 grains, or, roughly, double the quantity usually allowable when caustic soda can be used at all. If we look at the developer, then, from the point of view that it contains a very large proportion of alkali in its most powerful form and entirely unrestrained—for, as I have already shown, the acetone, as it were, withdraws the free sulphurous acid in the bisulphite from active interference, and the ordinary restraining bromide is not necessary—it is not at all difficult to comprehend the energy and rapidity of action of the combination.

In point of fact, the acetone-bisulphite compound appears to be able to play the curious part of exerting its full beneficial influence in preventing discolouration just as if it were free or uncombined bisulphite, and, at the same time, of causing no more interference with the developing action than if it were neutral sulphite, while yet it exerts a certain restraining power that suffices to overcome the tendency to fog that would otherwise accompany the use of caustic soda in conjunction with pyro. Its func-

tion, in fact, appears to be in every way identical with that of the acid carbonates if we regard the normal carbonates as owing their activity to an atom of caustic alkali restrained by an atom of acid carbonate:—$Na_2CO_3 + H_2O = NaHCO^3 + NaHO$.

What has been said in connection with acetone applies in a general way also to formalin or aldehyde, although there are certain minor points in the behaviour of the two classes of substances that give them very different characteristics in use. I had occasion to remark in a previous article on certain anomalies presented in MM. Lumière's formulæ when studied simply from the point of view of the formation of the bisulphite compound, to which so much reference has been made. Thus, in the acetone formula, in which the proportions of sulphite of soda (anhydrous) and acetone are as two to one, the quantity of the latter is enormously in excess of what is required, theoretically, to form the compound in question. On the other hand, turning to the formulæ for formalin, either with pyro or hydroquinone, the very reverse is the case, for whereas the quantity per ounce of formalin included in the pyro formula is 0·5 per cent., or 2½ grains to the ounce, theory would require about a fluid drachm, assuming commercial formalin to be represented—a 40 per cent. solution of formic aldehyde.

Looking at these anomalies, and also at the general character of the developer, it seemed to me that the benefits of acetone might be utilised in a much more direct manner by isolating the bisulphite compound and employing that as the restrainer, in conjunction with either the fixed caustic alkalis or ammonia. This is the only way in which caustic soda or potash can be used with pyro, and in that direction alone it may be regarded as a useful advance. Again, by so using it, a great saving in the quantity of acetone can be effected, and, in fact, the developer is brought generally more within control, both as regards quantities of material employed and effects produced.—*The Amateur Photographer.*

The X-Rays in Warfare.

By Surgeon-Major Beevor, R.A.M.C.

Doubtless you are all more or less aware of the nature of the injuries that are received by human beings in modern warfare, and I propose this evening to demonstrate to you the results which have been achieved in the alleviation of the suffering arising therefrom by the science for the study of which I presume this Club was organised. The experiences were gained during the recent campaign with the Afridis on the North-West frontier of India—a campaign conducted against an enemy than whom certainly a braver never existed, nor a more skilful artist in the use of modern fire-arms—and consequently we had an experience in wounds caused by bullets which was quite out of proportion to anything which history can relate. There were bullets of almost every description, and not only bullets, but missiles of various kinds. So long as he can have ago at his enemy with something hard, he does not care a rap what that hard thing is—a stone, a piece of lead of any sort, or a piece of telegraph wire. He relies upon telegraph wire for one of his chief amusements, because he likes to chop it into little bits and have a "snap-shot" at his enemy, whether one of his own people, or a "heathen"—*i.e.*, a white man.

You know, of course, how difficult it is to find and localise and extract offending bodies from the human or any animal organism. Now, the muscles of the back and the thigh, and the internal organs, are very difficult of access. Modern surgery has done a great deal; chloroform, which enables the patient to remain perfectly still, unconscious of pain, and therefore greatly helping the surgeon, has done much towards alleviating human suffering, but I humbly maintain that of late years no invention has come to the fore in this respect so forcibly as that peculiar phenomenon which its great discoverer calls the X-ray. To be able to localise, to define the size of, and to operate directly upon a foreign body in the human organism by means of this X-ray, is an incalculable benefit to the surgeon, and to his unfortunate patient; and to illustrate and demonstrate this, I should like to show you a few of the cases which occured to me while working the X-rays during this campaign. I am greatly indebted to Mr. Fincham, a photographer of West Dulwich, who has greatly helped me in the production of the slides. I found it most difficult to obtain a slide from a radiographic negative; it is all very well for people to show some of the beatiful things which one does see now-a-days, but I am afraid there is a good deal of "doctor" connected with them. Most of you know that it is almost absolutely impossible to get a sharply-defined outline in taking a radiograph by means of the X-rays, but Dr. Mackenzie Davidson has helped us to an enormous extent by what he calls the focus tubes, with which we can to a certain extent produce a well-defined image. The first slide is a representation of the bones of the leg of one of the Ghoorkas at the charge at Dargai, and it contains a fairly good outline of the bullet.

The next slide illustrates the first case in which I was successful in discovering a bullet which had defeated all surgical aids. This man—a Ghoorka—in our first fight at Dargaï, was shot in the back of his thigh, at the top of the hollow of the knee. Every means of probing was tried, but no bullet could be found, yet there was no aperture of exit, and we knew there must be a foreign body irritating the man's leg. By means of the X-rays we were enabled to exactly localise the bullet, which had traversed diagonally from above downwards and inwards, struck the bone, and rebounded in a channel of its own. To surgeons this has many interesting points. In the first place, you will say it is a funny looking bullet; so it is, but it proves the power of bony tissue to flatten out and to distort soft lead. It was fired from a native Afghan gun—a long, smooth-bore weapon, which has been used for centuries by these wild tribes, and is not of any great value; a bullet fired from this *ghezil*, as it is called, would scarcely pierce a sheet of iron about 1/100th in. in thickness at 200 yards, whereas a Lee-Metford bullet will go through 9 feet of wood. Another point of interest is that there was great swelling and irritation around the knee joint; we had felt all about, but could not feel the bullet, and you may imagine our disgust, after having developed the radiograph, to find that our friend which we had searched for so long was smiling at us within half-an-inch of the surface of the skin. It would have been impossible to have found that bullet until the swelling and the irritation of the wound had subsided; in fact, it might never have subsided, and it was in contemplation to amputate the man's leg. The picture shows, also, how bones can be pushed apart, and supporting ligaments which join two bones together can be stretched by means of irritation and inflamation inside the joint. All these little details prove the value of this wonderful X-ray to the surgeon, and more particularly to the military surgeon.

Returning to the first slide, the man in that case was shot on the inner side of the thigh, directly in a line with the large artery and vein, but fortunately wounding neither. It was wonderful how a ricochet and an uneven

missile would pass without damaging these blood vessels, because the aperture of entrance was in the middle of the inner surface of the thigh, and we found the bullet two inches below the upper end of the bones of the leg. A probe in that case would not go in more than about an inch, the track of the bullet being so sinuous; it had wound its way through many tendons or sinews, injuring some of them, and lodging within the sheath of a sinew. I saw the man about three days after he was wounded, and in passing on merely took the radiograph, which I afterwards sent to the hospital, but the day before it reached there the man had been sent away to make room for others who were pouring in at the time. After being up in the country for 4½ months I returned to the base hospital at Rawal Pindi, and when going round one day this man was pointed out to me as having stated that a sahib with a peculiar light had examined his leg, and they thought he referred to me. He had got, apparently, perfectly well, but he could not extend the leg more than an angle of 45°. We examined him again, and there, sure enough, was the same missile which had been there for nearly five months, and on cutting down we took it out, but with great difficulty. It is marvellous how nature will encyst foreign bodies in fibrous tissue, and so render them more or less harmless. In this case, however, the bullet was not harmless, because it shortened the tendon in which it was embedded, and prevented the man's leg being stretched to its full extent; when it was removed, and the tendon massaged, he made a complete recovery, and returned to duty in about six weeks' time.

The next slide represents a man's elbow—a Sikh—and almost the whole of a Martini-Henry bullet. He was shot on the inner side of biceps muscle, and was attended by a very intelligent and scientific surgeon in the Indian army, who probed and searched in every direction without success, and then sent the man away on furlough for six weeks. He returned, saying that he could not use his elbow—he got it at a certain angle, and then it locked suddenly; he could throw a stone, and even use a lance, but he was a cavalryman, and all his actions were awkward because he could not get his arm extended. They thought he was humbugging. The Indian soldier, no matter who he is, is a champion at humbug when it pleases him; he is a charming fellow in every way, but if he likes to "put on the agony" he can do it very successfully. Well, the surgeon said to me, "Will you have a look at this man? because he is such a good chap, and I don't think he is humbugging, but he wants to get married and go away on a pension." We examined him with a fluorescent screen, and instantly detected the cause of his disability; the bullet had slipped down through the muscle fibres of the biceps muscle into the sheath of a tendon, and had become encysted or surrounded by adventitious fibrous material. The surgeon cut down upon it, and it took him an hour and a half to dissect the bullet from the tendonous material with which it was surrounded, and when the tendon had been massaged and stretched, the man returned to duty. I suppose he got his wife, but he was an excellent fellow, and probably more pleased at being cured than he would have been at getting his pension.

To demonstrate what a very small matter will sometimes render a soldier incapable of doing his duty, I show you the foot of a non-commissioned officer of the Derbyshire regiment. I did not see him until the campaign was over, when I examined him at the base hospital at Rawal Pindi. He had been shot in the instep, probably by a charge of telegraph wire; four pieces of metal, thought to be telegraph wire, were extracted from the bones and sinews round the instep, but sometimes the Afridi—to add to the fun—would plug a stone or other object down his gun, as well as wire, and they extracted a piece of flint from the foot and thought the man would recover. In three months' time he was walking about on crutches, very cheery, but he complained that it was absolutely impossible for him to put his heel to the ground. For six weeks he tried to walk, without success, and then by means of a fluorescent screen we discovered a very minute piece of metal beneath the base of the bone of the heel. Round the heel is the periosteum, enclosing millions of blood vessels and nerves which render the covering of the bone extremely sensitive. A piece of lead, one-eighth of an inch in length, was embedded in that sensitive fibrous covering, hence directly the man tried to depress the heel, or to put any weight upon the neighbourhood of the heel, he felt the pain. The material which lies between the surface of the skin and the bone in this region is very peculiar construction, in which it is most difficult to find any foreign body, and certainly we should never have been able to localise this piece of lead but by means of this great aid to surgery.

Another interesting case was one in which we wanted to find the position of a foreign body which we thought was embedded in a man's haunch-bone. A probe went directly into the cavity of the pelvis for at least seven inches; a long bullet probe was inserted, the electric probe was tried, and various other means were used to localise the bullet, but without success, and I therefore took the radiograph, which is shown on the screen. The man was laid upon the photographic plate, and you see the representation of a posterior view of the pelvis, and the bullet is seen through the bone in the front of which it is embedded. That will show the power of the X-rays to penetrate even a considerable thickness of the bone. Just where the bullet is situated there is a joint between the spine and the haunch-bone, and at that point there is a buttress of bone very nearly 1½ inches in thickness. The man was apparently dying from blood-poisoning caused by the irritation and suppuration, and it was ultimately decided to send him home to England to recuperate. He improved very much on the voyage, and went to Netley Hospital, where Dr. Mackenzie Davidson and Professor Stevenson, to whom I had sent my radiograph, took another from the front, and Prof. Stevenson then cut down and extracted the bullet. The interest of the case, to those concerned with photography and radiography, is that it shows we can with certainty localise a foreign body which has a density greater than that of bone.

Here is a very indistinct representation of the elbow joint, taken under great difficulty, but it illustrates a case of much interest. The patient was a native soldier—a jemadar—of great value to the British service, who was wounded in a reconnaissance down a difficult defile in Tirah. He had command of a section of his regiment who were in charge of the ammunition mules, and as a great many of the enemy were educated in the ranks of our native army, they knew an ammunition from an ordinary transport mule, and they always made for it if possible. They made several hand-to-hand attacks on the guard of Sikhs, who drove them off and killed several of them, but as they were retiring one of them had a parting snap-shot at the jemadar, the bullet striking him in the elbow, and carrying with it a piece of his posheen coat—a covering made of goatskin, ill-cured, and with the hair remaining upon it. In about three hours the man suffered great agonies from blood-poisoning, and the limb swelled to an almost incredible size—I should say it had a diameter of quite a foot—and it was therefore impossible to find the poisoning body, and the surgeon in charge asked me to

examine the man. I did so, and, curiously enough, an hour afterwards, another man was brought in who had received a wound in the thigh through his poshteen coat. The two men were operated upon at once, large masses of sloughing or dead material were removed from the limbs, and the third day they were sent down to the base hospital. They made a perfect recovery, and ultimately returned to duty.

To illustrate the value of the X-rays in enabling the surgeon to observe and record the whole history of the healing or otherwise of his patients, I show you radiographs of the wrist of an officer of the 36th Sikhs. The bullet went right through the large bone of his wrist, split two bones, the joint was all disorganised, and a portion of the bone died from the irritation of little bits of lead and a part of a glove which had been carried into the wound and plugged between two ends of the bone. The first slide shows the wrist when it was in this condition, and the second represents the recovery, when the irritation and inflammation had subsided, and the swelling had lessened.

The next slide is taken from the hand of another officer who was suffering from blood-poisoning, portion of a leather glove having been carried into his wound. He was in such pain that the splints could not be removed; his fingers were embedded in antiseptic dressing surrounded by lead plaster, and I wish to call attention to the picture because it shows that even a minute quantity of lead, when incorporated with material such as we use in the manufacture of lead plaster, will resist the passage of the X-rays, and be discernible in a radiograph.

A curious case is illustrated by the slide now on the screen. A soldier on picket duty saw a sporting Afridi "drawing a bead" on him, and determined to return the compliment, but the Afridi had levelled first, and therefore got first shot. The shot was so good that, as our man was holding his rifle to fire at his enemy, it passed directly parallel with the rifle, entered his left hand at the centre of the bone of the middle finger, passed backwards, entered the other hand in exactly the same position, and ended up by being broken into pieces. The slide, taken five weeks after the receipt of the injury, shows the smashed bone, which died and almost disappeared; and in the next picture you see that the middle finger, which should be the longest of the digits, is now the shortest, having fallen backwards owing to its support having died and become absorbed.

Here we have the leg of a very brave and able General—General Wodehouse. I believe he does not know the meaning of the word *fear*. He walked about in an almost solid stream of lead and only received one wound, and that was in the leg. The surgeon took him into a tent, and, to show you the difficulty of fighting the Afridis, thirteen bullets passed through the tent whilst the missile was being extracted; a large portion of lead was taken out, and the General was as calm all the time as if he were in a London hospital. However, thinking that something had been left behind, he came to me at Rawal Pindi, and the radiograph that I then took demonstrates the power not only of bone, but of fibrous material, to break up a bullet.

It is not always necessary in warfare to take a radio- of a patient, as all that is required can sometimes be ascertained by means of a fluorescent screen, and a sketch can be made as a record as in the case to which I next refer. An officer was shot at Dargai, the bullet entering about an inch to the right of the breast-bone. It apparently travelled in front of the breast-bone, and emerged about an inch on the left side; he did not get well, however, but suffered from a cough and high temperature, and there were signs of some trouble in the lung. What had actually happened was this: The bullet caught him when he was turning round, struck the edge of the breast-bone, by which it was cut nearly clean in two; one half passed in front of the bone and went out at the other side, and the other half passed behind the bone and was found lying between the second and third rib, on the surface of the lung, and enclosed in the pleural cavity. We cut down and took it out, and the officer got quite well, but I am inclined to think he owes his life to the Röntgen rays.

[Major BEEVOR exhibited many slides, and described several cases, which are not alluded to in the above summary of his lecture, in the preparation of which it has been deemed sufficient to select some typical instances for the purpose of conveying an idea of the manner in which the lecturer had utilised the X-ray for the alleviation of the suffering of the wounded.]

In reply to some questions Major BEEVOR said that when he went to India he was more or less a tyro in X-ray matters, and he therefore depended upon Messrs. Newton and Mr. Apps for the selection of his apparatus. He only took three tubes, which he obtained from Mr. Cossor, and they were as good at the end of the campaign as they were at the beginning. The question of dynamos had been the subject of much discussion and experiment, and as a result there had been sent with the recent Soudan expedition a dynamo designed to work either by hand or by means of bicycle pedals. He took with him to India an 8-cell bichromate battery, and when at the base he came to the conclusion that that was the best apparatus to work upon the field because the necessary amount of sulphuric acid could be supplied by the field hospital. By organising a little transport he found it quite a simple matter to work on the lines of communication and at the front; although the climate was difficult and capricious—the temperature being at times 22° below freezing point at night, and during the day 100° in the shade—neither the coil, battery, or tubes were in any way affected. The Indian Government afforded him every facility in the way of transport, but transport camels or mules were out of the question where delicate apparatus was concerned, and he therefore swung it on dhoolie poles and bribed some native bearers to carry it.—*Report of a Lecture delivered at the Camera Club extracted from its Journal.*

The Latent Photographic Image.

WE stand before a highly interesting fact, when, upon an exposed dry-plate, which looks the same as before exposure, we see, under the influence of the developer, a strong picture form itself by degrees. What change can the light have produced in this exceedingly short space of time in the sensitive film? What is the invisible (latent) image? This question has caused a large number of investigators to reflect, and many hypotheses have been entertained regarding it; not only chemical, but also electrical, and even mechanical explanations for the latent image have been attempted.

The first latent image came under the observation of the discoverer of photography, Daguerre. A silver plate was treated to the fumes of iodine, and so made light-sensitive. After the short exposure it received in the camera no trace of a picture could be seen. But a picture did appear when Daguerre held the plate over heated mercury; the evaporated quicksilver precipitated itself on the parts of the silver plate which had previously been exposed to light. The analogy with Moser's breath pictures was sufficiently great to erroneously suggest a

"mechanical" explanation. An experiment which was, later on, made on gelatino-bromide plates could also lead to such a conclusion. For if a part of an unexposed dry-plate is submitted to strong pressure that part will become black in the developer, as if it had been exposed to light. Later on, however, this fact ceased to be considered as proof of a mechanical theory, as Carey Lea demonstrated that some salts may become chemically decomposed by strong pressure.

That electrical phenomena may be cerated by light is well known. This led to the establishment of several electrical theories of the latent image. Experiences of more recent times all speak in favor of the chemical nature of the latent image. The difficulties which this problem formerly offered are now being solved by closer attention or study of the character or nature of the development. Usually the formation of a negative on a dry-plate has been explained in this way: that the bromide of silver, during exposure, parts with some of its bromine: $AgBr + AgBr$ shall give $Ag_2Br + Br$. The resulting sub-bromide of silver is said to give up all its bromide to the developer during development: Ag_2Br is reduced to $2Ag + Br$. In reality, however, the development cannot be so simple a process. The reaction of the developer spoken of does really take place, but is not the only factor in the formation of the normal negative. In the first place, we are not even sure that a sub-bromide of silver combination actually exists. Yet, although not proved, the existence of such a combination is highly probable, and we believe that we may safely make such a supposition the foundation of the following explanations:

The second point, antagonizing the usual theory of development, is the following: If a dry-plate just from the camera is placed into a solution of hypo-soda the film becomes as transparent as glass: no trace of a picture to be seen. If the plate had—as our theory presupposes—really contained sub-bromide of silver, then at least a trace of metallic silver ought to have been left in the film. For the hypo-soda is supposed to reduce the sub-bromide of silver into bromide of silver and metallic silver: $Ag_2Br = AgBr + Ag$. Now, if such a fixed plate is placed into a solution in which nascent silver is slowly formed, for instance, in a mixture of gallic acid and nitrate of silver, a picture will then be seen to slowly develop itself. It follows that, notwithstanding the action of the fixing-bath, very minute particles of silver must have remained in the exposed parts, on which—in the subsequent treatment—the nascent silver deposits itself.

But now let us hold the two formulæ of fixing and development side by side. When fixing we get from one molecule sub-bromide silver: $Ag_2Br = Ag + AgBr$, an atom of silver. According to the above-mentioned theory of development we ought, *per contra*, to receive from it: $Ag_2Br = 2Ag + Br$—that is, two atoms of silver. Consequently, a dry-plate regularly developed and fixed—that is, a normal negative—would contain only double the amount of silver contained in a plate directly fixed without having been developed. Whoever has developed a negative knows that it holds incomparably more silver than would be its share according to this theory. I believe I may be permitted to infer from this that more of the silver salt in the plate must be reduced by the developer than the sub-bromide of silver present at the outset.

I have formed the following idea concerning this process: I assume, to begin with, that under the influence of the light some of the bromide of silver is transformed into a sub-bromide of silver. But this reduction takes place under very peculiar conditions, different from those in common laboratory experiments. Probably it is of great influence that the light in the camera or in the printing-frame has acted only from one side upon the sensitive film. In the emulsion the several molecules of bromide of silver were united into larger aggregations. Now each of these is reached by the light on one side only and only on this side reduced, consisting, after exposure of some molecules of unaltered bromide of silver (= b) and of some molecules containing a less amount of bromide, let us say sub-bromide of silver (= a).

If we adopt such an arrangement of the molecules in the film with a latent image we can also explain still further the action of the chemical development: The alkali developer reduces the sub-bromide of silver to metal by completely taking away the bromide: $Ag_2Br = 2Ag + Br$. In the moment of its formation the metallic silver unites with the nearly unchanged bromide of silver, forming sub-bromide of silver: $AgBr + Ag = Ag_2Br$; this newly-formed sub-bromide of silver is then reduced by the developer to metal, which again unites with the nearest bromide of silver molecule, and so on, till the whole lump is reduced to metal. We are supported in this by some observations on nascent metals, which we have described before. The atom of an element is, as we have explained before, under common conditions, always united with one or more other atoms to one molecule. Rarely only does it exist in an unchained state—a free atom. This occurs when an element is precipitated or driven out of a combination The part or body is for a short time in a nascent state. Its properties have changed entirely; its capacity to unite with other elements is greatly increased. In the physical development the silver, which has just been reduced by the developer from the nitrate of silver, joins itself into the exposed grains or kernels of silver of the image. Is the development a chemical one? Then the reduction in the molecule nucleus goes on by the nascent silver uniting with the near bromide of silver, forming sub-bromide of silver. The peculiarities of nascent bodies become so very evident in photographic processes for the reason that these processes are carried on more generally on gelatinous substances rather than in liquids, in which former the atoms can remain longer in a free state. They cannot move with the same facility as in liquids. As the developer, for instance, must penetrate into the first to do its work, quite a gradual mixture of the two reagents takes place, much slower than is attained by mixing two solutions. This fact has not at all been taken into account in the past. The explantion of the phenomena of light also would be far more advanced if it had been taken into consideration.

To make the communication or transfer of the developing action on the unaltered bromide of silver more plain, an illustration may here be given: A piece of wood does not burn spontaneously; but if touched with a flame it ignites. This ignition is an oxidation—*i.e.*, a uniting of the combustible body with the oxygen of the air. This once begun, it keeps eating further and further, and not only the ignited part is consumed, but the whole piece. The reason is, that the combination of the wood and the oxygen does not take place except at higher temperature. By the burning of the ignited particle (a) so much heat is developed that the particle (b), which lies right behind, is also brought to the temperature of ignition. It also oxidizes and furnishes the necessary heat for particle (c), etc. Any co-action of electricity does not come in here. Quite similar is the progress of reduction in the exposed bromide of silver kernel when the developer is applied. The latter, at the outset, reduces the tompost molecule of sub-bromide of silver to metal. This nascent metal combines with the nearest molecule of unaltered bromide of silver, forming sub-bromide of silver. This the developer reduces. The

The new metal acts upon the next molecule of bromide of silver, etc., until the whole kernel is changed into metal. The unexposed bromide of silver cannot be reduced by the developer, as the latter has no point of attack on it.

From the above indicated theory of development it appears that as a matter of fact, the alkali developer does not in reality continue the work of the light. The latter would not, even in a continued development, have changed the bromide of silver entirely into metal. It follows, then, that protracted development can never make up for under-exposure. Practice confirms this. If we expose, for a portrait, two bromide of silver plates of the same make, the one for a very short, the other for a very long period, we secure, using the same developer, very different results. In the first only the high-lights are rendered and a half-lights are wanting; the negative is hard and strong in contrast. The over-exposed plate gives the high-lights too weak, the shadows are full of detail; the effect is flat. The result of a normally exposed plate lies between the two In the under-exposed plate fewer kernels of bromide of silver have been acted on by the light than in the over-exposed one. Of ten molecule kernels in the first plate, perhaps only three have been supplied with the developable germ (Ag_2Br); in the one over-exposed six. The proportion of metallic silver in the two negatives, after fixing, will therefore be as 1 : 2. On the whole, all developers work alike. One may work a little quicker than some others, perhaps, because it penetrates the film quicker. But the one cannot bring out more in an under-exposed plate than another. When the effect of great over-exposure is counteracted and equalized by the addition of bromide of potassium to the developer it is because the bromide of potassium changes some of the molecules of sub-bromide of silver back to bromide of silver. It partially destroys the light-impression. With such and similar expedients two latent pictures of different strength may be made to develop nearly alike in quality.

Many phenomena are made plain now, because not the question, "What constitutes a latent image?" is emphasized, but "How does a negative develop itself from that latent image?" So, for instance, we may conclude from this theory that fine-grained bromide of silver need not of itself be more light-sensitive than the coarser. This difference need not show itself till the development, because then the reduction is more readily communicated from molecule to molecule in the case of coarser kernels than where these are finer-grained.

But one important quality of the chemically developed dry-plate we have so far ignored entirely, because its nature has not yet been explained—solarization. If we expose a gelatine-bromide plate considerably longer than is necessary for the production of a vigorous negative we receive in the development not a negative but a positive. The exposed parts are but feebly veiled, the unexposed, however, vigorously black. It has been supposed that the light, when allowed to act for a longer time, will undo again the reduction it had set up at first. The shadows, in the picture have in the meantime received so much light as to become black in the developer. The theory of a reversal of the light-action has been carried even further. The sub-bromide of silver is not only supposed to again take up—under prolonged exposure the previously liberated atom of bromide, but oxygen besides. We neither reject nor accept either view. But we would call the attention of those who wish to study this problem still closer to the possibility that the query may have been wrong in the past. Possibly we may not have to do at all with a reversal of light in this case. Just as the light-sensitiveness of the bromide of sliver emulsion seems to increase by ripening, because then the developer acts differently, so it might be in this case also. This new suggestion demands its share of attention.—R. ED. LIESEGANG, *in Wilson's Photographic Magazine*

"Something New."

A RECENT issue of *The Detroit Free Press* contains an interesting illustrated account of the "shadow pictures," or silhouettes, introduced by Mr. D. D. Spellman, of that city.

The idea of introducing such a subject as a speciality —booming the very beginning of things—is one which would occur to none but a live man, one who is ready to seize the right thing at the right moment. The silhouette revival in this case has given additional publicity to Mr. Spellman's work, and is doubtless leading patrons to his studio.

There is considerable value in a well-made portrait a la silhouette, provided its profile limitations are applied to the preservation of a good type. Poise, proportion and individuality of features, characteristic carriage and striking habits in dress, may be most effectively presented, and, before the days of Daguerre, silhouettes were very largely in demand and very highly prized.

As an artistic adaptation of the silhouette may be mentioned a recent portrait of a great musician, a combination showing the entire figure of the pianist in silhouette, while the piano at which he is seated and a few lines, indicating the character of the surroundings, are sketched in artistically, thus demonstrating a possibility in the use of silhouette drawing that is decidedly attractive.

The production of silhouette pictures is as old as mythology. The first silhouette was the charcoal outline of his shadow on the fire-lit wall, made by a Greek maiden when her lover left for the wars. The name silhouette is said to have been originally a term of contempt, signifying penuriousness, and applied to shadow pictures as the "poor relation" of art and photography. Some of the old silhouette workers were wonderfully clever, and their work far from a reproach.

The scissors are, however, now superseded by the camera, and even intricate silhouettes may be produced without a great deal of difficulty.

There are worse things than a case full of silhouettes with which to attract the attention of patrons The silhouette, devoid of accessory, makes a very direct and forceful appeal, and a good silhouette is often an unmistakable and characteristic likeness.

For taking silhouette pictures an ordinary room is, perhaps, preferable to a studio, in that all the light may come from behind the sitter. Choose, if possible a north light. In front of the window hang a thin white cloth, to soften the right. This should be hung some little distance from the window frame, so that no trace of shadow may fall upon it. It must be free from creases —fastened to rods top and bottom—to give an absolute flat light. In front of this screen place the sitter. All the light is thus arranged behind the object—supposing a room with a single window to have been chosen. There will be no difficulty as to how the picture will look, for the image on the ground-glass will be a sharp and distinct silhouette. A thickly coated and very slow plate should be used, with development for absolute density, and clear glass, and the negative should afterward be intensified. The best developer is pyro soda, with a fair amount of sulphite. If needful, retouching is easily done with a fine brush dipped in opaque pigment.

For printing, a matt surface paper is desirable. The silhouettes can, if preferred, be cut out and pasted on to a card, in exact imitation of the old style, or they may be printed on a sheet of paper giving ample margin. Generally they look best unmounted, or mounted on a card to give stiffness without a margin of card being shown.

Children are often very well rendered by silhouette, and a child may easily be taken full length. For this, a table should be placed before the window, at such a height that the top cuts the light. On this the child may be posed in profile—standing or sitting. With a little thought and experimenting many delightful poses may be evolved. The camera, in the case of a full length, should be placed with the lens at exactly the same height as the top of the table. If the lens were higher, the feet would, of course, be lost in the black mass of the table and the effect would be destroyed. Before printing, a strip of paper may be pasted across the table, reducing the ground to a narrow trip.—*Wilson's Photographic Magazine.*

A Hint on Copying.

By H. O. MOTT.

We have all, not doubt, seen at different times among the work of professional photographers copies made from photographs, the result being lacking in contrast, vigor, etc., and in fact entirely lacking in all that goes to make up a first-class copy. After returning, some time ago, from an inspection of the work of one of the leading photographers of the State, among which were several copies of the usual stamp, showing very plainly signs of having been doctored on the back of the negative, or some other similar device, I decided to experiment for a time upon this particular branch of our work in order, if possible, to obtain better results than we usually see. I may say my success was quite up to my expectations, and if my coworkers are interested in my procedure, I assure them it will amply repay a trial.

I make two exposures exactly the same, without moving the camera, so that I have, when completed, two negatives with the image in identically the same place on the plate. Now, without retouching either of the negatives, they are bound together at the edges with lantern-slide paper, so that one image is exact over the other. Now, if any retouching is to be done it may be done on the film side that is exposed. Then print in the shade. It will, of course, take much longer to print than it would from a single negative. But the resultant print will be found bright and full of contrast. It will also require much less spoting than is usual with a copy, and, in fact, is often far better than the original picture.—*Wilson's Photographic Magazine.*

Dr. Liesegang on the Theory of Silver Printing.

In a contribution to the *Photographische Correspondenz* (February, 1899 p. 78), Herr Liesegang reviews the well-known theory that the excess of silver nitrate, or other soluble silver salt, in printing-out paper, acts as a chemical sensitiser, by absorbing such chlorine as is liberated during the action of light on the silver chloride. He points out that if this theory is correct, there should be less nitrate of silver in the exposed parts than in the whites of the unfixed prints, and he brings forward several interesting observations and ingenious experimental proofs in support of this view as to the distribution of free nitrate of silver in unfixed prints; it being by no means improbable that new processes of value may arise out of his experiments. If a print on gelatino-chloride printing-out paper is placed in contact with a moist gelatine film containing gallic acid, a developing action sets in on the print by the action of the gallic acid, while a negative image of the subject gradually forms on the moist gelatine film by the diffusion of free nitrate of silver from the print, this diffusion being practically nothing where the moist gelatine film is opposed to a fully-exposed part of the print, while it is abundant where the moist gelatine film is opposed to a white portion. A similar proof of the abundance of free nitrate of silver in the whites of the exposed sheet, and its absence, or practical absence, from the fully-exposed portions, was afforded by laying a slab of jelly containing chloride of silver upon the exposed print; when the unequal diffusion of silver nitrate from the print forms a negative image, consisting of silver chloride, in the mass of the jelly. An ordinary sheet of albumenised paper or other thin printing-out paper will, as is well known, gradually become black at the back, even if kept in darkness, this change being due to the presence of silver nitrate. An exposed sheet if similarly kept will not become uniformly black at the back, but a negative image will be formed, owing to the fact that the image formed on the front by exposure withdraws the silver nitrate from portions of the paper. For a similar reason negative images at the back may occasionally be observed when physical development is resorted to in the case of a slightly-exposed print on a "printing-out" paper; and Herr Liesegang observes that very strongly-exposed parts will not develop, by reason of the absence of free silver. A suggestion is made that if an exposed sheet (of printing-out paper) is washed over with albumen, coagulation will take place on the whites, by reason of the soluble silver, but not on the deep shades, whereby a relief may be obtained.—*The Amateur Photographer.*

Solar Eclipse Photography.

At the meeting of the Ealing Photographic Society, on Wednesday, Major J. L. VanGeyzel, I. M. S., gave an interesting lecture, illustrated by about fifty lantern slides, descriptive of his experiences as a photographer in connnection with the observation of the total solar eclipse of January 22nd, 1898.

A total eclipse of the sun, said Major VanGeyzel, is one of the grandest and most awe-inspring sights in nature, and to the astronomer it is of the highest value, enabling him to study certain questions which at other times are quite beyond his reach. The shadow cast on the earth never exceeds a width of about 180 miles, and it passes at the rate of from twenty-five to fifty miles a minute.

The maximum duration of totality was only seven minutes. On the occasion in question the width of the shadow was but fifty miles, and the period only one minute forty-four seconds. The lecturer was attached to the party of the Madras astronomer, who pitched his camp in a jungle clearing at Satidol. The principal object of the party was to obtain photograph (of the sun's corona and for this purpose two instruments were employed—a photo-heliostat, fitted with a lens of five feet focus; and a larger instrument, with a lens of forty feet focus. Of this latter instrument Major VanGeyzel had charge. For the photo-heliostat quarter-plates were used, the image of the sun being 6 in. in diameter.

The large instrument gave an image $4\frac{3}{4}$ in. in diameter, and the plates were 16 in square. The plates selected were Wratten and Wainwright's Special Rapid, Edwards' Iso-Snapshot, Imperial Special Rapid, and Sandell Triple-coated. All were, of course, backed The exposures during totality varied from half a second to sixteen seconds. The plates were developed with pyro-soda.—*The Amateur Photographer.*

COMPETITIONS.

(Open only to Members of the Society.)

MARCH	*River Scene.*
APRIL	*Goats.*
MAY	*An Interior.*
JUNE	*A Tree.*

RULES.

1. *Two Special Competitions shall be held, in each year, in addition to a monthly competition.*

2. *The Committee shall select the subjects for the Special Competitions, and notice of the selected subjects shall be announced in the Society's Journal in February and in July of each year. The subject for each monthly competition shall be selected two months in advance by the members present at the monthly meeting, and shall be notified in the next issue of the Society's Journal.*

3. *Pictures, &c., competing for Prizes at the Special Competitions must reach the Secretary by the last day of January and of May, and those competing at the monthly competitions must arrive in time to be shown at the monthly meeting.*

4. *Prizes will consist of Silver and of Bronze Medals, and of Certificates of Merit.*

5. *Not more than one Silver and one Bronze Medal shall be given at each Special Competition, and one Silver and one Bronze Medal may also be given at these competitions for excellence in copying, enlarging, lantern slides, or any other special branch of photography. One Silver and one Bronze Medal shall be awarded half-yearly to the exhibitors who obtain the highest and the next highest marks respectively at the monthly competitions. The number of Certificates of Merit granted at each competition is left to the discretion of the Judges.*

6. *A member may receive only one Silver and one Bronze Medal in the special, and one Silver and one Bronze Medal in the monthly, competitions, held during the same year; but should a member who has been adjudged a medal be disqualified under this rule from receiving it, he shall be given a Special Certificate instead, marked 1st or 2nd Prize.*

7. *A Special Committee of three members shall be appointed Judges by the General Committee to carry out, subject to these Rules, all arrangements connected with the competitions.*

8. *The Special Committee shall be appointed after the Annual General Meeting in January, and shall hold office for one year, and any vacancy occurring will be filled up by the General Committee.*

9. *The Special Committee shall decide upon the merits of the pictures, &c., sent in for competition, and their decision shall be final. The system of judging the monthly exhibits shall be by awarding marks, a record of which shall be kept by the Judges, the marks being totalled and the results declared half-yearly. For this purpose, only the three highest marks awarded at each competition to each competitor shall be recorded, but not the aggregate marks gained by each for a number of exhibits.*

10. *If any member of the Special Committee is a competitor, the General Committee shall appoint a non-competing member to act as Judge at that competition instead of the competing member.*

11. *No exhibit shall compete twice, but pictures, &c., already exhibited elsewhere, may be sent in for the competitions.*

12. *Lantern slides sent in for competition shall be in sets of six, and shall be judged upon the screen.*

13. *The Special Committee shall not award any Prizes or Certificates, unless they consider the exhibits to be worthy of such distinction.*

14. *Each competing exhibit shall be the entire work of the exhibitor, and when sent in shall be accompanied by a Certificate in the annexed form:—*

> *"The (1) Arranging, (2) Exposing, (3) Developing, (4) Retouching (if any), (5) Printing and (6) Trimming and Mounting were done by me without assistance."*
>
> ———
>
> *Member, A. P. Socy. of Madras.*

15. *All pictures for the Special Competitions shall be mounted, and may, at the competitor's option, be framed but not glazed. Those for the monthly competitions need not be mounted, but should be trimmed.*

16. *Each competing picture should have a name or title, which should indicate the nature of the subject.*

17. *No competitor shall be allowed to send in more than six pictures to compete for any particular Prize, but the same member may compete in all branches specified in Rule 5.*

18. *The pictures gaining 1st and 2nd Prizes at the half-yearly competitions, and the best pictures sent for the monthly competitions, shall, when practicable, be reproduced in the Society's Journal.*

19. *To give up-country members an opportunity of seeing the competing pictures at the special competitions, the pictures shall be circulated to all members of the Society, not residing in Madras, who apply to see them. As this arrangement can only be carried out by the cordial co-operation of the members themselves, they are expected to forward the pictures without delay to the next member, and to send one of the accompanying post-cards to the Secretary, so that by this means the progress of the pictures may be traced.*

List of Members whose Dark Rooms are available for use by Members of the Madras Amateur Photographic Society.

T. P. S. NAGARATNAM, 47, Malayappen Street, Black Town.

E. MAENNIG, Buckingham House, Tranquebar.

J. CHOKANNA, AMILDAR, Bowringpet, Mysore State.

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Ordinary Meetings—*of the Society are held on the first Friday of each month at 6 p.m. and members are at liberty to introduce visitors.*

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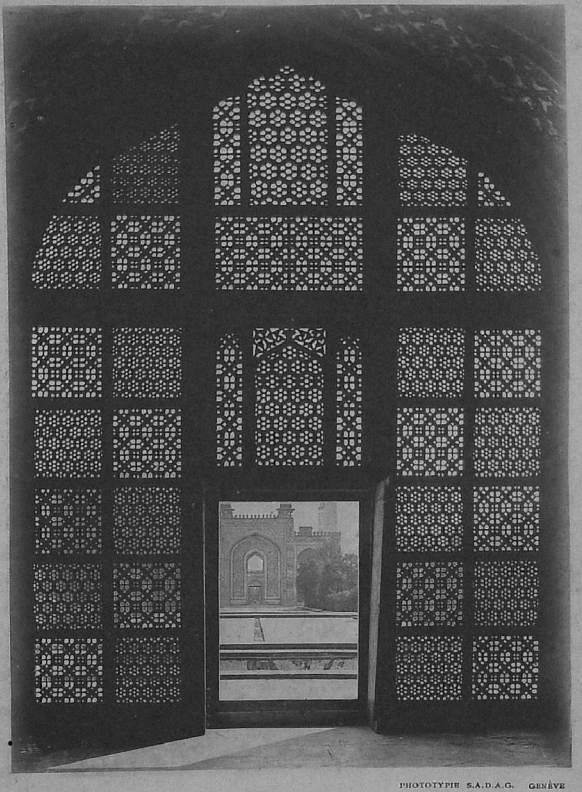

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