humble, to the solution of the problem of finding everything we require within our own boundaries.

I record with gratitude the assistance I got in my efforts from individuals and corporations over the whole of the country. Everybody that was likely to be in possession of any information bearing on the subject was approached by me, and everywhere I found the utmost willingness to co-operate. In spite of the fact that no efforts were spared on my part to make the paper complete, I feel that there must still be a considerable amount of information which I have not succeeded in collecting. I am particularly indebted to Dr. A. W. Rogers and Dr. A. L. du Toit, of the Geological Survey, for furnishing me with geological notes about the springs in the Cape Province; to Mr. A. L. Hall, of the Geological Survey, Pretoria, for a list and description of the majority of the Transvaal springs; to Mr. H. B. Maufe, Director of the Geological Survey, Bulawayo, for supplying me with information about the Rhodesian springs; and to Dr. C. F. Juritz, of Capetown, and Dr. McCrae, of Johannesburg, for placing many of the analytical data at my disposal. I also received valuable assistance from: Prof. P. D. Haln, Dr. W. Versfeld, Dr. W. Darley-Hartley, Capt. Dunley-Owen, M.D., Professor A. Young, of Capetown; Rev. Mr. Smit, Muizenberg; Dr. A. L. de Jager, M.L.A., Paarl; Mr. I. Meiring, Worcester; Dr. Bensley, Beaufort West; the Caledon Baths, Ltd.; Dr. Baumann, Mr. Frood, Capt. Heywood, Bloemfontein; Miss Wilman; J. W. Ross, Librarian, Public Library, Kimberley; the New Transvaal Chemical Company, Delmore; Dr. Wagner, Lieut.-Col. J. G. Rose; Dr. H. Brauns, Willowmore; Dr. Querney, Port St. John's; Mr. F. Dawson, General Manager of the New Cape Central Railway, Ltd.; Mr. H. F. Walker, Senr., Choma, North Rhodesia; Mr. T. N. H. Janson, Dullstroom; Dr. J. W. Matthews, Lilana; Mr. H. A. van Schalkwyk, Standerton; Mr. O. F. Brotherton, African Farms, Ltd., Johannesburg; Mr. H. Magennis, Balmoral, Uitenhage; Mr. F. Muller Rex, Oudtshoorn; Mr. J. Laing, Algoa Mining Company, Ltd., Port Elizabeth; Mr. A. Coster, Mr. G. Baumann, Bloemfontein; Dr. Macrae, Clocolan; Mr. J. Horne, Parys; Mr. Chas. McCulloch, Lindley; Provincial Secretary, Pretoria; Mr. A. C. Mitchell, Jagersfontein; the Van Riebeek Natural Mineral Water Co., Ltd., Capetown; the United Mineral Water Co., Ltd., Pretoria; Rev. Mr. Blazey, Dysselsdorp; the Secretary of the Transvaal Medical Council; *The Medical Journal of South Africa;* the Secretary, Colonial Medical Council; Mr. A. E. V. Zealley and Mr. G. Arnott, Curator, Rhodesia Museum, Bulawayo; the Magistrate, Piet Retief; and the Mayors and Town Clerks of Aliwal North, Bloemfontein, Clanwilliam, Colesberg, Graaff-Reinet, Machadodorp, Malmesbury, Willowmore, Worcester, Uitenhage and Vryheid.

Dr. P. J. Wilkinson, of the Van Rhyn Estate, has been recalled to the Defence Force Medical Service, and appointed Sanitation Officer to No. 5 General Hospital, Kimberley.

Military Plastic Surgery: Its Possible Influence upon Civil Plastic Surgery.

BY J. L. AYMARD, M.R.C.S., L.R.C.P.

Late Senior Specialist, Ear, Nose and Throat, The Queen's Hospital for Facial Injuries, Sidcup, Kent; also Plastic Surgeon, Cambridge Hospital, Aldershot.

The advance of this very ancient branch of surgery has been rapid owing to the immense material at hand during the past three years. A short account of the progress is not devoid of general interest.

At the beginning of the war facial injuries were distributed broadcast in the various hospitals, with a result by no means satisfactory to the patient, and one of the principal difficulties experienced at Cambridge Hospital was the number of these isolated failures which were sent there for treatment. It was felt that only by concentration for intensive study and treatment could the best results be obtained. Owing to the energies of Major Gillies and the supreme efforts of Colonel Sir Arbuthnot Lane, this result has been attained, and a huge central hospital has been established at Sidcup. This hospital is now represented upon its staff from all the Colonies except South Africa, which, for reasons, in my opinion, not altogether warranted, has remained apart. An exception to the isolated work carried on prior to concentration must be made: Mr. Cole, at King George Hospital, where good work has been done, but even in this case the advantages of co-operation would have produced even better work. In France the work of Mr. Lawson Whale, and the well-known dentist, Major Valadier, C.M.G., together with that of Major Kazanjou, of Harvard, is well known, and much of the dental jaw work is excellent. The dental jaw work in England, however, is upon a very high scale. I claim that the principal advances in plastic surgery have taken place in England, and this, I think, the French are prepared to acknowledge.

In January, 1917, I joined Major Gillies, and found him inundated with work, and until assisted by Mr. Seccombe Hett in October, the whole of the plastic work devolved upon us. The first improvement, I think, in the work consisted in the practical abandonment of the interrupted suture in tension adjustments. This work I described in the *Lancet* of September 1st under the heading, "Some Principles of Plastic Surgery—Incisions, Contour, and the Suture," to which article I must refer my readers, also to an article entitled, "Invisible Surgery," May 12th, 1906, describing my incision upon the slant now largely used in cosmetic surgery. With regard to bone work, I introduced Belgian iron wire in the place of silver, and many good results ensued. Major Gillies did some very bold rib grafts in jaw fractures with much loss of bone, and obtained excellent results. The next advance made was the reproduction of the red margin of the lower lip, a great difficulty in cases of micros-

teum and new lip formations. I surmounted this difficulty by dissecting the mucous membrane from the inside of the upper lip and sewing it, attached by its base, to the lower new lip. The patient was fed by a tube, and the membrane divided on the tenth day. This method was much approved by the French, and adopted by them, as likewise the mattrass system of suture. The next advance was the introduction of the double pedicle flap. It started with the making of a lower eyelid from the spare tissue of the upper, and ended with a large complete flap for a burnt face taken from the chest by my colleague, Major Gillies. The making of a complete lower jaw, described by Major Gillies in *The Lancet* of December 2nd, was a combination of the double-based flap. The bone work and the half of the plastic portion fell to my lot. The idea of taking the flap from the scalp belongs to my late colleague.

Rhino-plastic work, the most difficult of all, was rapidly developing when I left, but for a description I must again refer my readers to an article by my successor, Mr. Seccombe Hett, and one by myself entitled, "Nasal Reconstruction," both of which appeared in *The Lancet* of December 15th, 1917. Monsieur Movertein, of Paris, is credited with wonderful results, but unfortunately he prefers to keep his secrets. His methods are not those generally approved by his colleagues, who also did excellent work, and whose constant visits we cordially welcomed. German literature was forwarded by the War Office, but on no occasion did we find any novel or useful information, the pages being largely taken up by photographs of the various surgeons themselves. A description of the introduction of a cartilage sphere introduced into the capsule of a destroyed eye may also be found in *The Lancet*. This operation is being very generally performed owing to the excellent results obtained in the way of movement and prominence of the glass shell. If I have introduced my personal work into this article, it is only because I was so closely associated with each advance. My colleague, Major Gillies, though possibly not originating so many new methods, was, and is, a far better plastic surgeon than I could ever hope to be.

To sum up the advances made in plastic surgery during the present war, it is possible to say: That the extent and manner of making pedicle flaps has been reduced to a science. The tissues most suitable for reconstruction are now known, as also the most suitable places to employ them, and the best manner of adjusting the same. The most approved methods of skin-grafting, thanks to Esser, have been fully developed. The proper manner of employing sutures, retention and otherwise, has been practically demonstrated. The laws governing plastic operation, such as the postponement until all suppuration has ceased and the subsequent entire removal of the scar tissue have been definitely defined. The correct method of treating compound comminuted fractures of the jaws has been established. The most approved methods of sterilising wounds by light treatment have been decided. The most suitable dressings are now known, and the value of massage in after-treatment has been thoroughly understood. Free skin grafts of any magnitude have been proved to be unsuccessful. Further, the introduction of foreign bodies, more especially paraffin, both solid and by injection, has been most justly condemned as unsurgical and useless, and many minor novelties, such as cartilage spheres for destroyed eyes, lower eyelids from eyebrows, etc., have been introduced with much success. And, finally, the removal of skin scars and scar tissues can now be undertaken with a confidence quite unattainable before this vast opportunity presented itself.

Influence upon Civil Plastic Surgery.

This may be summed up almost entirely in "the removal of scars."

Whether produced by the surgeon or by accident, it may safely be said that no scar, however large, is beyond treatment and improvement at the hand of an experienced plastic surgeon.

Extensive burns on the face or hands are capable of considerable improvement.

Sunken scars can be filled in by the readjustment of the deep tissues in a manner unknown before the war.

Unsightly sunken scars produced by frontal sinus operation and disease can be most successfully eradicated.

Nasal deformities, sunken noses, etc., only hitherto mildly approached, can now be remedied with the greatest accuracy and confidence of complete success.

I have been repeatedly asked, what can be done for the specific nose? As these cases for the most part occur amongst the poorer classes, who would probably not submit to any prolonged hospital treatment, the question will not be a large one.

Provided the disease has, however, been got under control, the field is not unpromising.

In these cases the septal support is usually almost entirely absent, and a new septum would have to be constructed, not after the manner described by my late colleague in the current *Lancet*, but outside the nasal cavity. The swinging of the septum, if present, into a forward position is described by Mr. Hett, but was previously performed by me in a recorded case at the hospital with excellent result. For a specific nose devoid of septum I would insert cartilage into the buccal mucous membrane, and when established, eventually swing upwards into the nasal cavity, the ridge of the nose being stiffened with cartilage. The other method likely to prove effectual is the transverse introduction of an arch of cartilage. But each case would have to be decided upon its merits.

The technique of hare-lip, mastoid deformities, nasal stenosis, aural stenosis, eyelid deformities, and many other defects, can now be dealt with, ensuring fairer measures of success and better cosmetic results than hitherto.

Fractured jaws in civil life have hitherto seldom been compounded, and therefore will only be slightly influenced by the general advance.

Atrophic rhinitis, an almost incurable disease, offers a very hopeful field with every possibility of permanent success.

Lastly, the staring deformity produced by an immovable sunken glass eye, is another serious defect now effectually overcome.

The above can only be dealt with in book form, which at a later date I hope to be able to publish.

I must add that I much deplore the extravagant praise which has been bestowed upon our work, both by the leaders of our profession and the editors of medical journals. Speaking for myself, I am quite certain that any capable surgeon, given the unique opportunities which I enjoyed, would have done considerably better work. I can only add that no surgeon showed the slightest ambition to relieve me, otherwise I would have been quite willing to retire and occupy some less strenuous position.

The average plastic operation takes from two to three hours, the operator being surrounded by chloroform, from which he suffers severely, and each case presents a different problem, which often takes days to evolve. Possibly for these reasons the work does not attract the general surgeon.

Rules for Medical Inspection of S.A.P. Recruits.

In order that the profession generally may see the point of remarks we have made elsewhere, we print in full the Regulations for medical examination, from S.A.P. Circular 91.

A. Standard.

The following shall be the standard required:—

Age: 18 to 35 years..

Height (minimum): 5 feet 6 inches for Mounted Branch; 5 feet 8 inches for Foot Branch.

Chest measurement (minimum): 33½ inches at 18 years, 34 inches at 19 years and upwards.

Physical and mental fitness for the performance of police duty.

Ability to read and write either English or Dutch.

B. Instructions to Medical Officers Examining Applicants.

1. In the inspection of recruits the principal points to be attended to are:—

That the recruit is sufficiently intelligent.

That his vision, with either eye, is up to the required standard.

That his hearing is good.

That his speech is without impediment.

That he has no glandular swellings.

That his chest is capacious and well formed, and that his heart and lungs are sound.

That he is not ruptured in any degree or form.

That the limbs are well formed and fully developed.

That there is free and perfect motion of all the joints.

That the feet and toes are well formed.

That he has no congenital malformation or defects.

That he does not bear traces of previous acute or chronic disease pointing to an impaired constitution.

That he possesses a sufficient number of sound teeth for efficient mastication, or is provided with well-fitting artificial teeth to the satisfaction of the medical examiner.

2. Men possessing any of the following conditions will be rejected:—

Indications of tubercular disease; constitutional syphilis; bronchial or laryngeal disease; palpitation or other diseases of the heart; generally impaired constitution; under standard of vision; defects of voice or hearing; pronounced stammering; loss or decay of teeth to such an extent as to materially interfere with efficient mastication, unless he will at his own expense have such decayed teeth attended to or replaced by well-fitting artificial teeth to the satisfaction of the medical examiner; contraction or deformity of chest or joints; abnormal curvature of spine; defective intelligence; hernia; hæmorrhoids; varicose veins or varicocele, if severe; inveterate cutaneous disease; chronic ulcers; fistula; traces of corporal punishment; or any disease or physical defect calculated to unfit them for the duties of a police officer.

3. Great care is to be taken in ascertaining the mental capacity of a recruit.

4. The height, weight, and chest measurement of a recruit should accord with each other, and with his age. So far as concerns weight, the table is to be regarded as a guide only, and the medical officer is to exercise his own judgment as to the general fitness of the man under examination.

5. When not required to approach the recruit for special objects, the medical officer should always take his place at a distance of about six feet from him. The recruit should be placed so that the light may fall upon him.

6. The recruit having, if possible, had a bath, or been washed, and being wholly undressed, the following shall be the order in which the examination is carried out:—

He is measured.

He is weighed.

His chest measurement is taken.

His vision is tested.

If he satisfies the requirements in these respects, and appears otherwise eligible, the general examination will then be proceeded with:—

He is directed to walk up and down the room smartly two or three times, to hop across the room on the right foot and back again on the left. (The hops should be short and on the toes.)

He is halted, standing upright, with his arms extended above his head, while the medical officer walks slowly round him, carefully inspecting the whole surface of his body.

An estimate is formed of his general physique and of his age.