ST. ANDREWS INSTITUTE FOR CLINICAL RESEARCH.

THE recent opening of an institute for clinical research in St. Andrews marks the beginning of a new era in the scientific development of the art of medicine. The enterprise has been initiated and brought to a happy stage of working order by Sir James Mackenzie, who is the director and controlling mind of its endeavours.

Briefly, the object of the institute is to investigate the early symptoms of disease before structural alterations in the body have had time to take place. Hitherto research has been mainly concerned with disease and its more advanced forms when structural and chemical changes can be detected by ordinary laboratory methods. But at the beginnings of disease symptoms of various kinds, often seemingly trivial, do occur. They become familiar to many general practitioners, though no serious attempt has been made to determine their cause and significance and to draw up a classification which will enable the medical man to appreciate their real meaning and thus put him into the position of being able to detect and arrest incipient disease.

For such purposes a small centre of population, where the same patients can be seen frequently and observed over long periods of time, is preferable to the larger centre with its rapidly moving population. St. Andrews should provide an ideal site, and has the further advantage of possessing a university and medical school with all that these imply. A suitable building has been secured overlooking the bay and in close proximity to the historic golf course.

The institute is affiliated to the University. Its staff consists of a director, a director of laboratory research, a trained biological chemist, a bacteriologist (to be appointed), a whole-time clinical assistant, and several part-time clinical assistants who are also practitioners in the town.

Three days a week patients are examined, and two days are given over to general discussions. The latter are wide in scope, and are freely opened to anyone who has anything to contribute. The trained logician and psychologist are especially welcome, and not infrequently join in the debate.

The institute is also educative, and aims at the training of the practitioner in the methods of research.

The institute has now been at work for some months, and is already bearing fruit. It has promoted harmony and goodwill and a keen interest in their work among its members. It provides an excellent model for the development of other centres, and shows how a spirit of co-operation can be fostered among medical men which is of mutual benefit to themselves and to their patients. The scientific results will follow.

P. T. HERRING.

FISHERY INVESTIGATIONS IN SOUTH AFRICA.

THE Marine Biological Report of the Province of the Cape of Good Hope (No. 4) for the year ending June 30, 1918, has recently been received. The report is signed by Prof. J. D. F. Gilchrist, and although it appears that his department has been greatly restricted by lack of funds, it is clear that much useful work was done during the year under review. It is well known that a valuable industry in canning and exporting the local crawfish has been developed successfully at the Cape in recent years, and perhaps the most interesting feature of the report is an account of the habits of the different larval stages of this crustacean. The first larva of *Jasus lalandii* is small, somewhat opaque, and swims at the surface by its feather-like antennæ, the other appendages being folded close to the body and not used. This first stage, known as a "naupliosoma," continues for only a few hours, when it passes into the flattened "phyllosoma" stage. The larvæ in this stage are able to swim in a horizontal direction, but their natural habitat is still the surface waters. They were successfully reared, and after three or four days at most they passed into the third larval stage, in which they descend to the bottom and seek out the darkest corners. They then feed actively on the small animal and vegetable particles in the mud and sand, and are comparatively free from the attacks of their enemies. After undergoing a series of moults, which do not yet appear to have been followed in detail, the larva enters the "puerulus" stage, which has hitherto been found only close inshore.

Details of a number of experimental hauls for crawfish in different localities are given in the report, as well as an account of some marking experiments, which have thrown light upon the migrations of this crustacean. A useful list is added of the different species of lobsters and crawfishes found in South African waters, with short, popular descriptions drawn up by Mr. K. H. Barnard. Prof. H. B. Fantham contributes a short article on parasitic protozoa found in South African marine fishes, and the third and final list of Cape fishes, drawn up by the late Mr. W. Wardlaw Thompson, is included in the report. The strong recommendation of Prof. Gilchrist that the scientific fishery investigations, which have been suspended for a number of years, should now be resumed is one which will have the hearty support of all marine biologists, who know the valuable work which was formerly carried out under his direction.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—At the meeting of the council held on January 29, the Pro-Vice-Chancellor in the chair, Mr. C. Grant Robertson received a cordial welcome as Principal of the University.

The thanks of the council have been accorded to Mr. Arthur Serena for his generous offer to provide a sum of 5000*l.* towards the endowment of a department of Italian studies and a chair of Italian. Also to Mr. John Smith, of Edgbaston, for his offer to endow a prize for students in metallurgy in some educational establishment or establishments in Birmingham, to commemorate the contributions made by Prof. Turner to the science of metallurgy, to be known as "the Thomas Turner prize (or prizes) in metallurgy."

Lt.-Col. J. E. Dixon (Messrs. Rabone Bros.), Mr. Frank Gower (the Birmingham Aluminium Casting Co.), and Mr. Donald Hope (Messrs. Kynochs, Ltd.) have been appointed members of the Commerce Advisory Board.

Prof. John Robertson and Dr. C. J. Lewis have been appointed representatives of the University at the Congress of the Royal Sanitary Institute to be held in Birmingham in July next.

Mr. James Young has been appointed an assistant lecturer in the department of physics.

CAMBRIDGE.—The offer of a fund to endow a John Couch Adams astronomership in the University is announced. The offer was made by the late Mrs. Adams, widow of Prof. Adams, the discoverer of Neptune. The post, if established, is to be held by the director of the observatory unless he be at the same time a professor of the University, in which

case it should be held by a duly qualified person of skill and experience in astronomy not necessarily a member of the University. The income of the fund is about 300*l*.

A further offer is made by the family of the late Dr. E. G. Fearnsides to endow an E. G. Fearnsides scholarship to further clinical research among the organic diseases of the nervous system. The scholarship would be held by Cambridge men for two years between the ends of their fourth and eleventh years. The award is biennial, and the income 50*l*. a year.

Mr. H. M. Fox, Mr. F. Debenham, and Mr. C. N. H. Lock have been elected fellows of Gonville and Caius College for research work in zoology, geology, and mathematics respectively.

LONDON.—Dr. Samuel Smiles has been appointed to the Daniell chair of chemistry tenable at King's College in succession to Prof. A. W. Crossley. Last year Dr. Smiles was appointed professor of organic chemistry at Armstrong College, Newcastle, and since 1913 he has been senior honorary secretary to the Chemical Society.

Dr. H. E. Roaf has been appointed to the University chair of physiology tenable at the London Hospital Medical College. From 1902 to 1905 Dr. Roaf held the Johnston Colonial fellowship in the University of Liverpool, where he has also been assistant lecturer on, and senior demonstrator of, physiology and histology and lecturer on chemical physiology. Since 1911 he has been lecturer on physiology at St. Mary's Hospital Medical School. For three years during the war he was in charge of the pathological laboratories at Cairo.

Prof. T. Swale Vincent has been appointed to the University chair of physiology tenable at the Middlesex Hospital Medical School. Prof. Vincent was formerly demonstrator of physiology in the University of Birmingham and Sharpey scholar and assistant professor of physiology at University College, London. Since 1904 he has been professor of physiology and biochemistry in the University of Manitoba.

The cordial thanks of the Senate have been voted to the general committee formed to promote the institution of degrees in commerce and the organisation of commercial education in the City of London and throughout the Empire for a gift of 50,000*l*. to be devoted to the extension of the buildings of the London School of Economics upon land provided for this purpose at a nominal rent by the London County Council.

A resolution was adopted by the Senate on January 28 expressing appreciation of the generosity of Messrs. S. B. and J. B. Joel in presenting 20,000*l*. for the endowment of a University chair of physics tenable at the Middlesex Hospital Medical School. Steps are being taken immediately for the appointment of the first incumbent of this professorship, which will bear the name of the donors.

The Franks studentship in archæology is open to a student qualified to undertake research or to prepare for the same. It is for the period of a year, and of the value of 50*l*. Full particulars are obtainable from the Academic Registrar of the University of London, South Kensington, and applications for the studentship must be received by, at latest, the first post of March 2.

The following doctorates have been conferred:—*D.Lit.*: Mr. R. E. M. Wheeler, an internal student, of University College, for a thesis entitled "Comparative Notes on Rhenish Potterv of the Roman Period." *D.Sc.* (*Engineering*): Mr. Marcel Tolkowsky, an internal student, of the Imperial College, City and Guilds College, for a thesis entitled "Diamond Grinding, Abrading, and Polishing."

MANCHESTER.—Mr. Frank Watts has been appointed lecturer in psychology in the University. Mr. Watts is the author of the recently published book, "Echo Personalities," a study of the contributions of abnormal psychology towards the solution of some problems of normal education.

OXFORD.—On February 3 Convocation resolved that Mr. E. S. Goodrich should be constituted professor of comparative embryology for so long as he holds the appointment of Aldrichian demonstrator in comparative anatomy. The resolution was proposed by the Rev. G. B. Cronshaw, Queen's College, and supported by Prof. Gilbert C. Bourne, Linacre professor of zoology and comparative anatomy.

The amended statute making the study of the Greek language optional for all students will come before Congregation on February 10. At a later date not yet fixed it will be submitted to Convocation. Opposition may be expected, as in many quarters it is not considered desirable that candidates for honours in such schools as that of "Literæ Humaniores" should be exempted from the study of Greek. If Prof. Gilbert Murray's amendment, exempting all science men, mathematicians, and passmen, had been carried, it is probable that no opposition would have been offered to the statute on the part of the advocates of Greek.

COMMDR. C. HAWKES has been appointed to succeed Prof. R. L. Weighton in the chair of engineering at Armstrong College, Newcastle-upon-Tyne.

DR. T. F. SIBLY, at present professor of geology at Armstrong College, Newcastle-upon-Tyne, has been appointed principal of the University College of Swansea.

SIR ARCHIBALD GARROD will deliver the Schorstein memorial lecture at the London Hospital Medical College on Friday, February 20, at 4 o'clock. The subject will be "Diagnosis of Disease of the Pancreas."

THE Women's Medical Association of New York City is offering the Mary Putnam Jacobi fellowship of about 200*l*. for post-graduate study in any country to any woman physician for work in any branch of medical science. Particulars are obtainable from Dr. Murrell, 86 Porchester Terrace, W.2.

THE lectures for teachers on recent developments in science arranged by the London County Council include a lecture on "Aviation" to be given by Mr. F. Handley Page at King's College, Strand, W.C.2, on Saturday, February 28, at 11 a.m. The chair will be taken by Sir Arthur Duckham, K.C.B.

A REUNION dinner of Old Centralians—the first to be held for six years—will take place on Saturday, February 21, at the Waldorf Hotel, Aldwych, W.C.2, tickets for which may be obtained from Mr. G. W. Tripp, Lyndhurst, Hayes Road, Bromley, Kent. We understand that Prof. Armstrong, Sir Alfred Keogh, and Prof. Unwin have accepted invitations to be present.

A CORRESPONDENT informs us that the New South Wales Parliament, in the session that closed in December last, passed an Act granting the University of Sydney a sum of 300,000*l*. for building purposes, the grant to consist of six annual instalments of 50,000*l*. The grant is in addition to the statutory endowment, and is called for by the rapid growth of all the departments of the University. It will allow the University to devote the whole of the McCaughey bequest to the extension of the present resources in

staff and equipment, and the encouragement of research.

A SCHEME for the establishment of a University Bureau in the City of London in connection with the University of London commerce degree is described in the *Times* of January 30. It is proposed that the bureau shall assist in the suitable and wide employment of commerce degree students and graduates in all branches of trade and commerce throughout the country and assist employers in all matters affecting the training and employment of all such students and graduates. An initial sum of 50,000*l.* has been set aside for the purpose of establishing the bureau on a proper footing.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 22.—Sir J. J. Thomson, president, in the chair.—Prof. E. G. **Coker** and K. C. **Chakko**: The stress-strain properties of nitro-cellulose and the law of its optical behaviour. The physical properties of nitro-cellulose are studied from its behaviour in tension, whereby values of Young's modulus and Poisson's ratio are obtained and the form of the load-extension curve is determined. The optical properties of the transparent material are observed, with special reference to its behaviour under load; and it is shown, by observations with a comparison beam not stressed beyond elastic limit, that the relative retardation produced between the two components of a polarised beam is consistent with a linear optical stress law, which holds up to stresses of about twice those at the elastic limit. These results are confirmed by observations of the retardation bands produced in a polarised spectrum by a beam under uniform bending moment. The stresses and strains are deduced on the assumption of a linear stress-optical law, and stress-strain curve so obtained is found to agree with purely mechanical measurements of a tension member.—S. **Marsh**: Alternating-current electrolysis. The behaviour of platinum, gold, and nickel electrodes during the passage of an alternating current of 25 to 80 cycles per second has been examined. The electrolytes employed were dilute sulphuric acid and barium hydrate solution. Curves representing the relation between volume of gas evolved and time of passage of current are of two distinct types: (*a*) One type resembling "saturation-current" curves in radio-activity. This effect is shown clearly in the cases of platinum and gold in an acid electrolyte. (*b*) A second type in which the rate of evolution of gas falls off with time until ultimately a steady rate of evolution sets in, *decreasing* in value with *increasing* frequency of the alternating current. Two possible explanations of the phenomena are discussed: (*a*) Adsorption of hydrogen at an electrode during one half-period, followed by recombination with oxygen in the succeeding half-period. (*b*) Oxidation of the electrode by the oxygen of one half-period, followed by reduction of the oxide by the hydrogen of the succeeding half-period. Evidence is given that the oxidation theory successfully explains the effects with gold and nickel. In the case of platinum it is believed that oxidation plays a prominent *rôle*, though adsorption also may be effective in this case. It is shown that the electrodes have an initial surface activity in promoting recombination, which activity increases (*a*) with frequency of alternation, and (*b*) up to a maximum value with the time of passage of the current. If the current density is less than that corresponding to this maximum activity, then sooner or later evolution of gas ceases. If the current density is greater, then after a time gas is evolved at a steady rate.—W. H. **Eccles** and J. H. **Vincent**: The variations of wave-length of the oscillations generated by three-electrode thermionic tubes due to changes in filament current, plate voltage, grid voltage, or coupling. When electrical oscillations are sustained in a circuit comprising inductance and electrical capacity by aid of a three-electrode thermionic vacuum tube of the kind used in wireless telegraphy, the frequency of the oscillations and the wave-length of the radiation depend principally upon the values of the inductance and the electrical capacity, but also partly upon the resistance in the oscillatory circuit; upon the voltages of the various batteries in use; upon the temperature of the filament supplying the electrons; upon other properties of the vacuum tube; and upon the coupling between portions of the circuit associated with the grid and the anode. The object of the present investigation was to study experimentally the effects of altering each of the chief variables, with the view of finding the conditions most favourable for the production of continuous oscillations of constant frequency. For this purpose two circuits were sustained in oscillation at nearly the same high frequency, namely, about 120,000 vibrations per second, and the audible beat between these frequencies was observed. Then changes made in one circuit alone caused variations of frequency that were measurable by acoustic observation of the beat-note. The preliminary investigations showed that variation of the heating current of a filament was the most fertile source of erratic changes of frequency, and resulted in the discovery that increase in the filament current of one tube produced at low values of current a decrease of frequency, and at higher values an increase of frequency, while at a certain value of filament current the frequency had a stationary value. This phenomenon provides a method of setting an oscillation generator so as to produce a vibration of frequency constant to less than one part in 100,000. Provided with this knowledge, the other problems enumerated above were attacked. In an apparatus in which the inductance was eight millihenries, the electrical capacity 250 electrostatic units, and the wave-length 2750 metres, it was found that raising the voltage of the anode battery from 130 to 140 increased the wave-length by 6 metres, and raising the grid voltage by 1 increased the wave-length about 10 metres. The coupling in the circuit produced large effects by its variation.—S. D. **Carothers**: Plane strain: the direct determination of stress. It is pointed out in the first part of the paper that in plane strain the stresses, if determined directly, are usually obtained by the aid of the well-known stress function method. The problem is usually that of finding a function χ satisfying $\nabla_1^4\chi=0$ throughout the body, with suitable values of χ over the various boundaries. The most general value of χ in Cartesian co-ordinates appears to be

$$\chi=A\theta+Bx\theta+Cy.\theta+D(x^2+yY\theta),$$

where A, B, C, and D are any constants and θ is any plane harmonic function. It is shown that for any orthogonal co-ordinates the stresses derived by the stress-function method when applied to $\chi=(x^2+y^2)\theta$ can always be resolved into two distinct sets, while in the case of Cartesian co-ordinates the stresses can be split up into four distinct sets. In view of the foregoing, the present paper has for its object the determination of the various sets of stresses which might legitimately occur in a state of plane strain, expressed in the simplest possible terms, with the view of rendering the building up of a given state of stress a manageable operation. The paper sets forth the usual stress equations of equilibrium,