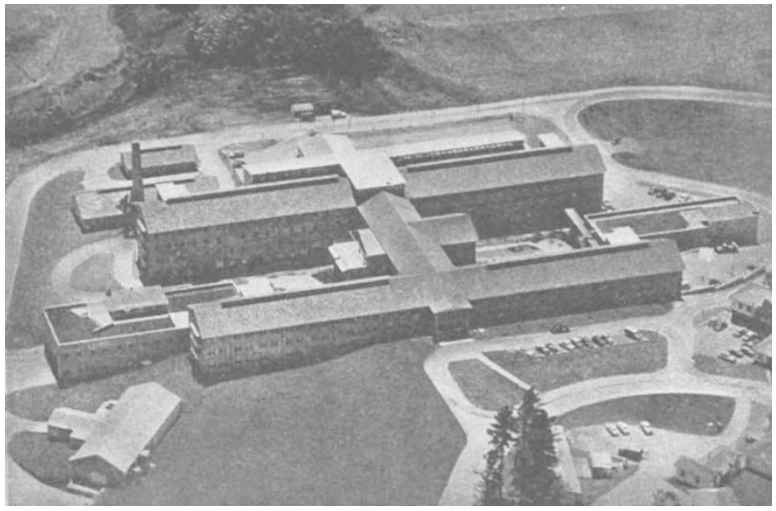

Fig. 1. The John Curtin School of Medical Research, Australian National University, Canberra

of some 7,000 sq. ft. floor area—one for non-infected and the other for infected animals; an animal-breeding establishment some four miles away, and a large light-engineering workshop.

The laboratory wings have on the south side laboratories 20 ft. deep and on the north side service rooms (hot rooms, cold rooms, etc.) and studies 14 ft. deep. The laboratory layout on each floor-level is adapted to the needs of the particular department, but within the departments it follows a standard plan.

At present there are five departments—biochemistry, experimental pathology, medical chemistry, microbiology and physiology. Prof. A. H. Ennor, head of the Department of Biochemistry, is also dean of the School. His department comprises nine staff and five research students, and is concerned principally with enzymology of phosphorylated guanidines. Prof. F. C. Courtice, well known for his researches on physiology of lymph flow, etc., has just been appointed to the chair of experimental pathology. Prof. Adrien Albert heads a group of seven research workers and two research students in the Department of Medical Chemistry. His work on heterocyclic chemistry is familiar to most British scientists, and he now has greatly increased facilities for this work. Prof. F. Fenner, with seven staff members and eight research students, is investigating various aspects of animal virology, principally with the pox viruses and influenza viruses. The Department of Physiology, headed by Prof. J. C. Eccles, specializes in neurophysiology. Prof. Eccles is at present president of the Australian Academy of Science. His distinguished investigations made by micro-electrode methods are widely known, and he is assisted in this work by seven staff members and four research students.

At present the total research staff is about forty and there are some twenty Ph.D. students; but the John Curtin School of Medical Research is still in the process of growth, both in the sense that several new departments will be developed over the next few years to fill in gaps in the present structure, and in the development of each individual department. The new building just opened by Sir Howard Florey provides excellent facilities in a wide range of the medical sciences and already the School is established as a research institution well known throughout the world.

HIGH ENERGY NUCLEAR PHYSICS

THE annual international conference for 1958 on High-Energy Nuclear Physics, which was held in Geneva during June 30–July 5 under the sponsorship of the International Union of Pure and Applied Physics was the successor to those that have been held annually in Rochester, New York, for the past seven years. Over these years the size and duration of the Conference had increased from a small one-day meeting to a full week of intensive sessions recognized as the most important conference on high-energy physics of the year. It was the general opinion at Rochester in 1957 that the volume of effort and the number of contributions had grown to such an extent that the traditional system whereby each contributor presented the results of his experiments had become unworkable and, short of the undesirable step of limiting the scope of the conference still further, it was evident that some new method of presenting the material had to be tried. This year at the European Centre for Nuclear Research (C.E.R.N.) the conference was divided into ten half-day sessions and all contributions in a particular field were presented to the conference by one person, the rapporteur, whose job it was to introduce the subject and to present and to explain the significance of the results obtained. The talks by the rapporteurs were expected to take up approximately half the session and the other half was left for discussion or for the presentation of special papers which did not fit well into the rapporteur's general scheme. The success of this procedure depends very much on the rapporteur. Contributors were asked to submit their papers to him some four weeks before the plenary sessions. Organizing sessions were arranged on the three days preceding the conference proper to enable participants to meet their rapporteur and if necessary to discuss their contributions with him. As an additional preliminary rapporteurs were asked, prior to the Conference, to provide participants with a reading list which would serve as an introduction to the subjects.

The general opinion at the end of the Conference was that the new method of presentation had been enough of a success for the method to be tried again. It was most successful where the rapporteurs, having been selective in the choice of their material, had leisure to present it in a critical way and not merely as a report of a large number of different experiments.

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One of the main disadvantages of the rapporteur system lies in the fact that the reports are very concentrated. Contributors tended to remain anonymous with this method of presentation and it was felt that some advantage would have been gained if mimeographed sheets had been made available before each session, giving the title and authors of the contributions so that further details could the more easily have been sought from them afterwards. Tables of important results would also have proved most valuable. The next International Conference is expected to be held in Moscow in July 1959, where the organizing sessions are to be enlarged to enable contributors to present their results in greater detail to the rapporteur and to others working in the same field.

The first plenary session was devoted to experimental and theoretical reports on nuclear structure. Most of the results reported concerned high-energy electron scattering. Both the charge and magnetic-moment scattering of electrons by protons differs markedly from that obtained on the assumption of a point particle. The results suggest a root-mean-square value for the charge radius equal to that for the magnetic moment, both being equal to 0·8 fermi (1 fermi = 10^{-13} cm.) for the proton, and a similar value for the radius of the neutron magnetic moment distribution, obtained by a comparison of electron–proton and electron–deuteron scattering. The charge core of the neutron appears to be zero at low momentum transfers although a value of 30 per cent of that for the proton at large momentum transfers is not ruled out by the limits of accuracy of the measurements. The different charge radii for the neutron and proton raise the question whether charge symmetry holds or whether the interpretation of the results based on quantum electrodynamics is correct. A word of caution was given by Hofstadter against reading too much into the results until the accuracy is improved, but nevertheless the theoretical interpretation is in a very confused state.

Experiments with muons which can be compared with similar scattering experiments with electrons may be expected to shed more light on the structure of the nucleon during the next few years. The plea for some experimental information on the electromagnetic structure of the pion may have to wait a little longer.

In the two sessions devoted to the nucleon and its interaction with pions, photons, nucleons and anti-nucleons, some uncertainties which existed at the 1957 Conference in Rochester appear to have been satisfactorily resolved. In 1957 there was evidence that the coupling constant, f^2, obtained from the real part of the forward-scattering amplitude for negative pions via the dispersion relation was very low. However, new measurements of the negative pion–proton scattering cross-section have been made which bring the calculated value of f^2 into line with other determinations. A final value of $f^2 = 0{\cdot}0885 \pm 0{\cdot}002$ was quoted. The experimental and theoretical values for the 'Panofsky ratio' are now also believed to be in good agreement although this was only clarified after considerable discussion. Evidence for the Fermi set of phase shifts is also now well established. An excellent review of the theoretical position was given by Chew. The subject of greatest interest during the past year has been the dispersion relations and the possibility of their violation. However, the theoretical studies that have been made confirmed the belief that the Goldberger relations for forward scattering have a very general basis. Another development was a new type of dispersion relation which allowed a precise determination of the pion coupling constant. A basic question which continues to be obscure is whether it is possible in terms of the pion and nucleon masses and the coupling constant to predict the position of the (3/2, 3/2)-resonance and the small size of the non-charge-exchange S-wave scattering. In the GeV.-region, optical models of the pion-scattering results suggest that the pion–pion interaction is important.

The dispersion relation approach has also been applied to the problem of photon–nucleon scattering and the agreement of theory with experiment is improving. A great deal of discussion centred on the results obtained at Cornell and the California Institute of Technology, where photo-production processes appeared to show a resonance behaviour corresponding to excited states of the nucleon at 300, 600 and 1,000 MeV. The discussion was not conclusive.

There was also much discussion on the possible origin of the spin-orbit interaction introduced into the phenomenological nuclear potential by Gammel and Thaler and by Marshak and Signell last year. The large antinucleon–nucleon total cross-sections have, in fact, now been reasonably explained using a Signell and Marshak type of potential, and although this is again a purely phenomenological approach the feeling has subsided that the large experimental values for the antinucleon–nucleon cross-section would require a major departure from the Yukawa picture.

It is almost traditional now for the discovery of yet another new particle to be announced at the annual conference. This year the anti-Λ^0-particle was reported to have been observed in a two-prong-star event at Berkeley, decaying via a positive pion and antiproton, with a Q value of $35\ ^{+2{\cdot}6}_{-0{\cdot}9}$ MeV. In addition, a cosmic-ray event in a two-level cloud chamber belonging to the Pic du Midi group of the École Polytechnique has provided evidence for the cascade Ξ^0-particle. During the past year, six groups have been doing experiments to establish evidence for the particle of 500 electron masses which was first reported by Alikhanian some years ago. The general conclusion was that its existence was not yet firmly established. More experiments are still being carried out.

In the production of the Λ^0-particle in the pion–nucleon interaction, within the limited accuracy of the measurements, parity is conserved. Existing data are also in agreement with the conservation of isotopic spin. The interaction of K-mesons is explained most reasonably by a pseudo-scalar meson of spin zero. Below 100 MeV. in K^- interactions there is no evidence for anything other than S-waves being important.

One session was devoted to special topics, of which the most interesting related to the origin of the mass of the electron and whether it was entirely electromagnetic or not. An associated problem was the question of the large mass of the muon. It was suggested that a precise measurement of the magnetic moment of the muon would be of great value in order to check whether there was any departure from the value predicted by electromagnetic theory.

Perhaps the most remarkable achievement of the year has been the effort that has gone into the study of parity non-conservation in weak interactions. The two-component neutrino theory is now well estab-

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lished. Parity non-conservation appears to be complete and no deviation from invariance under time reversal is observed. There are, however, some points which are not clearly understood. For example, non-conservation of parity is observed in hyperon decay where no neutrino is involved. The magnitude of the $\pi \rightarrow e + \nu$ and $\pi \rightarrow \mu + \nu$ branching ratio provoked much discussion, and it was emphasized that this could prove a very critical test of the universal Fermi interaction. The interaction is now well established as '$V - A$' (vector, axial vector) but the reason why it should be so is still unknown. The beta-decay of the Λ-particle is another puzzle. The present experimental results set the limit for this mode of decay at not more than 1 in 1,000 and they are, in fact, consistent with zero. A new value for the Michel parameter, $\rho = 0{\cdot}735 \pm 0{\cdot}022$, was reported from Berkeley in better agreement with that expected theoretically (0·75). However, the errors quoted are purely statistical and when systematic errors are allowed for, this value may again be changed.

In the case of non-leptonic modes the bulk of the new information concerned the decay modes and the branching ratios for Λ^0 and K^0 and the life-times of Λ^0, K^0 and $\Sigma^{\pm}$. From a study of the angular distribution of the decay with respect to the production direction it appears possible to assign to both the Λ^0 and Σ^- particles a spin of one-half. One new experimental technique, the scintillation chamber, was discussed at a small separate session. It may prove to be a useful new development.

The organizers at C.E.R.N. are to be congratulated on their efficient handling of the conference. The discussions were recorded on tape, typed and in the hands of those concerned for correction within twenty-four hours. The full proceedings of the conference including the talks by the rapporteurs are expected to be available to the participants by October.

G. H. Stafford

NEWS and VIEWS

Entomology and Parasitology at Liverpool : Prof. R. M. Gordon

Prof. R. M. Gordon, who is to retire from the Dutton and Walter Myers chair of entomology and parasitology in the University of Liverpool, acquired an interest in parasitic and arthropod-borne diseases during his army service in Serbia after his qualification at Trinity College, Dublin. Joining the staff of the Liverpool School of Tropical Medicine, he worked in the School's laboratories on the Amazon and in Sierra Leone. He relinquished the directorship of the latter laboratory in 1937 to occupy the chair in entomology in Liverpool; later the chair in parasitology was amalgamated with this. For the past twenty years, in spite of heavy teaching and administrative duties, Prof. Gordon has continued to engage in active research. Primarily a naturalist, not a systematist, he has maintained a 'zoo' of living parasites and their vectors rather than a collection of 'specimens' in his department. Many workers have achieved distinction following the sound training and wide practical experience gained in his department. Early in his career Dr. Gordon, with D. B. Blacklock, first demonstrated immunity to metazoan parasites. The meticulous detail of his work is to be seen in some remarkable micro-cinematograph recordings of the penetration of the mouth-parts of blood-sucking arthropods and their feeding methods. Latterly, the filarial infections have claimed his attention; he largely has originated and directed the helminthiasis research units now working on this problem in West Africa. Prof. Gordon's achievements have entailed much work on committees, which he serves wholeheartedly. The Royal Society of Tropical Medicine and Hygiene conferred its Chalmers Medal on him in 1937; recently it made him its president.

Dr. W. E. Kershaw

Dr. W. E. Kershaw, who is to succeed Prof. R. M. Gordon, joined the staff of the Liverpool School of Tropical Medicine in 1945 as a lecturer in parasitology. He served afloat, and later as a pathologist ashore, with the Royal Navy during the Second World War, and while stationed in Ceylon his contact with the parasitic infections of man determined his future interests. Dr. Kershaw's interests have primarily centred on the helminthiases, and in particular the filariases. His work on the latter has been original and outstanding, and he has travelled widely on field studies in this context. In 1955 he was awarded the Chalmers Medal of the Royal Society of Tropical Medicine particularly for his work in this subject, and his services are in frequent demand at conferences on it in Great Britain and elsewhere. Dr. Kershaw continues an active association with the Navy as a surgeon-commander, an activity which affords opportunity for a more clinical application of his abilities, and which should be of benefit to the Service to which he is proud to belong.

Geology at Southampton : Dr. F. Hodson

Dr. F. Hodson's appointment to the newly created chair of geology at Southampton will give pleasure to geologists at home and abroad, particularly the younger generation. Trained in geology at the University of Reading, Dr. Hodson had the advantage (many forward-seeing geologists would say a necessity) of coming to the subject from two basic sciences. Initially a works chemist and by inclination a zoologist, he was well equipped to profit from university life and ultimately to undertake those researches in Namurian stratigraphy and palæontology for which he has become widely known. His work has shed new light on the Upper Carboniferous rocks of several key areas in western Europe: particularly western Eire, Belgium and the Valenciennes coalfield. In collaboration he has contributed to Jurassic stratigraphy and palæontology. At Reading Dr. Hodson has built up a flourishing Carboniferous research school, devoted mainly to opening up the exciting territory of western Eire. He will take to Southampton not only a tremendous enthusiasm and deep conviction that the 'research outlook' should dominate undergraduate teaching, but also an all-round fitness to foster the several facets of geology and to maintain a sensible balance between competing interests. The University of Southampton may confidently look forward to the

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