amount, boards which were very highly rated being given a higher scale of subsidy. The Social Security contribution was an addition and the Social Security Scheme also found money for out-patient treatment and for maternity costs. It seems that the Government's contribution may go as high as 75%. It should be understood that an additional grant of 5s. per bed is made for soldier patients, which is, of course, far below the cost of treatment and maintenance.

The Last Word and the Last Straw

For many years the principle of hospital finance in New Zealand has been considered by optimistic people to be not only static but ideal and a model for other countries. The principle of this system has been in effect that the general Government taxation provided about half of the cost and the rest was paid by ratepayers. There seemed little moral obligation on patients under this system to pay for their maintenance and treatment out of their private purses, and only an amount of approximately 3s. a day per head was collected from patients. This amount seems very low seeing that any person, rich or poor, has the right to receive treatment in these tax- and rate-supported hospitals. The Social Security tax amounts to 1s. in the pound on all wages and incomes and commercial profits, and this proves quite insufficient. To make up the balance nearly four million pounds had to be drawn from general Government revenue last year. No medical practitioner service has been provided owing to opposition from doctors who decline to be "nationalized" under the conditions proposed by the Socialist Government. All medicines except proprietary medicine have lately been made free for both hospital and *private* patients, and all hospital treatment is free. The result of all this has been that the number of patients in hospitals throughout New Zealand has increased alarmingly, out of all proportion to any increase in population. Thus, State control has not been an unqualified blessing and has created new difficulties of a grave order, especially when the chief task of the country is the prosecution of the war effort. Any further increase in the huge burden of hospital costs will suggest to the minds of many people the time-honoured story of the last straw that broke the camel's back.

Correspondence

Penicillin

SIR,—Your annotation on penicillin (August 30, p. 310) is very welcome to me, who in 1929 discovered and named this very potent substance produced by a certain type of penicillium. It is true that all the work on this substance originated in the accidental contamination of a culture plate with a spore of this penicillium, and in my first paper on the subject a photograph appears of this culture plate. (Incidentally, this culture plate still exists.) I think, however, I can claim some merit in the discovery, as without a doubt the same mould has contaminated hundreds or thousands of culture plates and has merely been regarded as a nuisance.

There are many species of penicillium, and, at first, on the advice of a mycologist then attached to our laboratory at St. Mary's Hospital, it was referred to as *P. rubrum*. It has since, however, been examined by other experts in Europe and America, and the known species to which it has the closest affinity is *P. notatum*, although the type culture of *P. notatum* does not produce penicillin.

I do not think that you quite do me justice when you say that, although penicillin was used at St. Mary's and elsewhere as an ingredient of selective media, it "does not appear to have been considered as possibly useful from any other point of view." In my first paper on the subject in 1929 I made observations on its antiseptic properties against many species of bacteria, on its toxicity to leucocytes *in vitro*, and on its toxicity to animals. I showed that the simple unconcentrated culture could, even when diluted some 800 times, inhibit the growth of pyogenic cocci, while it was no more toxic to leucocytes or animals than the broth in which it was grown. I had previously, in 1924, shown by the slide-cell technique that all the antiseptics in common use had a much greater inhibitory effect on leucocytes in human blood than they had on bacteria, and until I found penicillin there was not a chemical antiseptic which by this simple *in vitro* test could be considered as an antiseptic of the first class for the restriction of growth of bacteria in human tissues. This led me in my original paper in 1929 to allude to the possibility of the use of penicillin as an antiseptic, and paragraph 8 of the summary of this paper reads: "It is suggested that it may be an efficient antiseptic for application to, or injection into, areas infected with penicillin-sensitive microbes." In a later paper, on "Some Problems in the Use of Antiseptics," published in the *British Dental Journal* in 1931, I discussed the possibility of the use of penicillin as a surgical antiseptic and made the following statement: "Penicillin is valuable to us at present in the isolation of certain microbes, but it is quite likely that it, or a chemical of similar nature, will be used in the treatment of septic wounds."

These extracts from my papers show that wider uses for penicillin than selective culture media have been envisaged from the beginning, and the last quotation indicates that ten years ago I had concluded that the practical application of penicillin in surgery depended on the chemist who could isolate the active principle and manufacture synthetically this or an allied compound.

Prior to the second article cited (1931), a few tentative observations had been made on the effect of the local application of the unconcentrated culture to septic wounds (chiefly carbuncles and sinuses). Although the results were considered favourable there was no miraculous success. In those times septic wounds in the hospital wards were relatively uncommon, and it was not considered that the production of penicillin for the treatment of these was practicable, owing to the lability of the active principle in solution. The lability of the active principle is still a stumbling-block, but the Oxford workers have to some extent overcome it by extracting an impure active agent and keeping it in the dry state. This great advance has enabled a clinical trial to be made which has more than justified the suggestions I made ten or more years ago.

I have shown (*Proc. roy. Soc. Med.*, 1941) that dried penicillin, with which the Oxford workers kindly provided me, is many times more powerful than the most potent of the sulphonamide compounds. Penicillin does not appear to belong to the sulphonamide group, and if the active principle could be isolated in the pure state, and if its constitution could be ascertained, it would lead to the production of another series of chemotherapeutic agents which may well replace sulphanilamide and its derivatives in medical practice.—I am, etc.,

St. Mary's Hospital, W.2, Sept. 1. ALEXANDER FLEMING.

Planning for Mental Health

SIR,—Some interesting points are raised by the report of the B.M.A. committee on the handling of problems of mental health and illness (August 23, p. 276). On the incidence of mental illness, for instance, one fallacy seems to be current, and from your note even the committee does not seem to have avoided it. It is said that "the incidence of mental illness is difficult to ascertain," and the witnesses apparently gave discrepant assessments and have not much helped the committee.

May I suggest the reasons for this apparent discrepancy. On analogy, compare mentally ill people with physically ill people. The physically ill fall roughly into two classes: those who are chronically or permanently ill and those (constituting the vast majority of normal or at any rate average people) who have intercurrent or occasional illnesses. Not one of us has had no physical ailment, serious or trivial, at some time or another; yet we do not consider ourselves as diseased. The nervously or mentally ill (the word "mental" has an unfortunate connotation in that to most people it implies insanity or psychosis—"maladjustment" would be a more suitable word) fall similarly into two classes. On the one hand are those who have become chronically neurotic or psychotic or who are constitutionally mental defectives, and on the other are the vast majority of us who at some time or another have had or will have nervous complaints and temporary maladjustments—that is, minor depressions, spells of acute anxiety, serious sexual, personal, marital, economic, or