

HOUSING

'Rachmanism' rears its head again

by PAUL FELDMAN



THE TORIES will intensify the Labour government's attempts to drive down the housing conditions of the workers as part of their attack on the conditions of the whole class.

The publicity given to London landlady Mrs Elsie Raum who was imprisoned for evicting a tenant and his family gives one indication of their policy.

The Tories and their Fleet St friends want to see a return to the days of Rachman. Following the 1957 Tory Rent Act millions of tenants found themselves with little security of tenure and were often the victims of thugs employed by the big landlords to chase them off the property.

Labour's 1965 Rent Act improved security a little, though rents rose. Then, under pressure from the bankers to deflate the economy they clamped down on house-building and switched instead to modernization of existing property.

This was what the Housing Act 1966 was about.

Its most important aspect was the decontrolling of rents where property had been modernized. The Labourites not only gave landlords money to repair dilapidated property, but allowed them to put up the rents as well!

The Tories have taken their cue from this Act.

The Land Commission will be abolished. This was a half-hearted attempt by Labour to cream off in the form of betterment levy some of the profits made in land speculation and to buy and sell land cheaply to local authorities. For the Tories it is full-steam ahead for open speculation and fat profits.

Tory policy is the abolition of blank subsidies for council tenants' rents. They propose to charge what is loosely known as 'economic rents' — that is economic for Tory councils and their allies in the City.

The Tory GLC talks of £12 or £13-a-week rent for its tenants, with a means test for those who can't pay.

They have begun to implement this policy by announcing an increase of 10s a week from March 1 for GLC tenants, only six months after a similar increase. It is not unusual now to find GLC rents of more than £8 a week.

Local authority house building is to be slashed and authorities are to be given the all-clear to sell as many houses as they can, a policy that Labour adopted before the general election.

Surplus myth

Labour accepted the myth of the 'housing surplus' — an excess of total houses over potential households — and used it as an excuse to cut back on building.

The Tories will act on it with a vengeance. Rents will soar, evictions will increase, and prices will encourage speculation and many more offices will be built.

This article will attempt to show the housing position in London and the provinces and will look at the relationship of housing to capitalism.

The report on London's housing issued by the Ministry in July illustrates the squalid housing conditions endured by millions of workers, the present state of London's housing stock and what changes can be expected by 1974.

The report, 'London's Housing Needs up to 1974' (No. 3, 6s) says that in April 1966 there were 2.4 million dwellings in the Greater London area. There were an estimated 2.6 million potential households, that is families, groups, and individuals who formed households or would

have done so but for the shortage.

The study says that 131,000 houses were either vacant or for the housing market to function freely or were not available because they were used as second homes.

The number of houses short was 326,000 or 12 per cent of all households. By mid-1969 the figure fell to 233,000. But little building took place in inner London, where most of the shortage is and one third of the



Mr GEORGE CLARKE: Try praying

reduction was accounted for by migration from the central areas.

To these figures must be added 370,000 misleadingly termed 'unsatisfactory dwellings'. These are those that are about to fall down and those which lack basic amenities such as toilets, running water and bathrooms but which could possibly be repaired.

Added to the number of houses short we get a total of 696,000 houses too few for people living in London in 1966. In one London borough the shortage amounted to over half of all the households in the area.

By 1969 the unsatisfactory dwellings had fallen by 53,000 to 317,000, giving a total deficit of 550,000 at the end of the year.

Underestimates

The authors admit these figures are gross underestimates of the position. The definition of 'unsatisfactory' is narrow and does

not take into account multiple-occupation. And it ignores the fact that the number of houses unfit to live in grows as age overtakes them. GLC surveyors estimated that the number of unfit houses would leap by 110,000 in the period 1966-1974.

Even less convincing than the narrowness of the report's concepts are its predictions. It is estimated that by 1974 the stock of buildings will have increased, leaving a deficit of 106,000 compared with 233,000 today. And the report claims the number of unsatisfactory dwellings will fall to 230,000 from 317,000, giving a total deficit of 336,000.

The study assures that council building will not only hold its own in the next four years but actually increase and the same claim is made for private building.

But last year's housing figures showed the biggest fall in any year since the war. And with the deepening of the economic crisis there is no reason to believe the trend will be reversed.

Someone must have pointed this out to the people who compiled the report because tucked away in the last column of one of its tables is an alternative estimate of the future position.

Based on current figures these estimates give a total deficit of houses, including those considered unsatisfactory, of 498,000 by 1974. Add to this their own conservative estimate of 110,000 more unfit dwellings and you get a staggering shortage of 608,000 houses in London in four years time.

Outside London the situation is the same. In Glasgow there are 50,000 families on the council's waiting list and 70,000 houses are unfit to live in.

Birmingham has 30,000 on the waiting list, with 6,500 applying each year; some 40,000 houses are unfit. Liverpool has 70,000 unfit houses and 35,000 people living in overcrowded conditions.

What is the solution to the housing question?

Des Wilson, ex-head of Shelter, the charity for the homeless, talks about convincing the powers-that-be of the position. He is constantly involved in dispute with the Ministry of Housing and Local Government over the definition of those considered homeless.

His view is that if only people could see what misery terrible housing conditions bring to millions of people then something would be done about it.

But this is not the answer.

All the figures quoted in this article are from government sources. Yet the Tories plan to make squalid conditions appreciably worse.

Claptrap

Other solutions range from praying, as Mr George Clarke recently did, to Communist Party plans to lower interest rates to encourage building and the

freezing of rents.

This piecemeal reformist and idealist claptrap avoids the basic issues of the housing question which Engels illustrated in his writings.

His three articles on housing were written in 1872 in reply to 'solutions' put forward by a social reformist and a follower of Proudhon. Engels wanted to fight against the idea of gradual reform of the evils of capitalism, housing being one of them, which were present inside the German Social Democratic Party.

Engels shows how housing is bound up with capitalism and how the abolition of a housing shortage means the overthrow of capitalism.

He says, 'It (the housing shortage) cannot fail to be present in a society in which the great labouring masses are exclusively dependent upon wages and in which improvements of the machinery, etc., continually throw masses of workers out of employment.'

He goes on, 'Violent and regularly recurring industrial fluctuations determine on the one hand the existence of a large reserve army of unemployed workers, and on the other drive the mass of the workers on to the streets unemployed.'

'Workers are crowded together in the big towns at a quicker rate than dwellings come into existence under prevailing conditions and, therefore, there

must always be tenants even for the most infamous pigsties.

'Finally the house-owner in his capacity as capitalist has not only the right but by reason of competition, to a certain extent also has the duty of ruthlessly making as much out of his property in house rents as he possibly can.

'In such a society the housing shortage is no accident... it is a necessary institution and can be abolished together with its effects on health, etc., only when the whole social order from which it springs is fundamentally refashioned.'

Capitalism will not and cannot do away with the housing shortage and squalid conditions.

To show that this is true Engels returns to the centrepiece of Marxist theory, that of the creation of surplus value.

The worker sells his labour power to the capitalist employer in return for a wage. During his working hours he soon produces the equivalent of the value of his wages. For every minute after that he is producing surplus value and profit for the capitalist.

Engels argues that wages approximate more or less to that which can keep the worker alive and enable him to propagate his kind. Obviously a worker needs a roof over his head if he is to fulfil this function, but no more than that.

The question of the state of this roof is not in question and

the capitalist class is not interested in that.

If rents in any period are tending to fall wages will also tend to fall.

No solution

Engels examines the capitalist solution to the housing problem

and he says 'In present-day society just as any other social question is solved: by the gradual economic adjustment of supply and demand, a solution which ever reproduces the question itself anew and therefore is no solution.'

As an example he cites the process by which speculators and investors, together with govern-

ment authorities, make breaches in working-class areas of cities.

It does not matter whether the reasons are those of public health, the demand for centrally-located business premises or new traffic requirements. The result is that the worst houses disappear only to reappear somewhere else, often in the immediate neighbourhood.

In the Ministry report it is estimated that 135,000 houses in London will be pulled down by 1974. Not all of these are slums; many demolitions will be the result of 'central area redevelopment', or to make way for urban motorways.

The law of supply and demand means that whatever is supplied is more profitable than something else. Workers' houses are not as profitable as offices or shops.

So houses are built while others are demolished to make way for more lucrative investments and in this way capitalism is incapable of solving the housing question, even if it wanted to.

Engels shows how reformist demands, such as the abolition of rented property, or individual ownership of houses, leaves capitalism untouched. This is why all sorts of public bodies are prepared to discourse on the subject and why the field is such a rich one for charlatans and charities.

The relationship in housing is between tenant and landlord, or house-owner. No surplus value is produced, although the tenant may be swindled into paying more for the property than it is worth. To abolish one part of the capitalist class would still leave the working class exploited by the employing class as it was before.

The housing problem is caused by capitalism. The demands of tenants and those involved in a struggle for better housing must be linked with the overthrow of capitalism or they will remain isolated and ineffectual.

The lessons of the struggles of the tenants' associations, many of them led by Stalinists and revisionists, is that the leadership prevented them from developing into political struggles.

Diversions demands were made such as lower interest rates and rents freezing while rent strikes were embarked upon without preparation and in complete isolation from the trade union movement.

The result was often bitter disillusionment for the tenants who saw their efforts dissipated into useless, blind-alley campaigns.

The frustrations over housing must be drawn into the struggle to construct the revolutionary party for the overthrow of capitalism. Demands must be made which strike at the roots of the questions. Tenants' associations must be linked with the trade unions in the fight to defeat the Tories.

Nationalize the banks, land, building societies and building industry without compensation under workers' control!

Force the Tories to resign!

TV

BBC 1

12.50-1.25 p.m. Dechrau canu dechrau canmol. 1.30 Watch with Mother. 1.45-1.53 News, weather. 4.20 Play school. 4.40 Jackanory. 4.55 Blue Peter. 5.20 Scooby-doo, where are you? 5.44 Babar. 5.50 News, weather. 6.00 NATIONWIDE. Your region tonight, weather. 6.45 THE DOCTORS. 7.05 TOP OF THE POPS. 7.45 BACHELOR FATHER. 'Family Feeling'. New comedy series. 8.15 THE GOOD OLD DAYS. Old-time music hall. 9.00 NEWS and weather. 9.20 PRIZEWINNERS. 'In Need of Special Care'. The Camphill School for mentally handicapped children in Aberdeen. 10.20 24 Hours. 11.05 THE SELLING GAME. 11.30 Weather.

REGIONAL BBC

All regions as BBC 1 except: 11.30 Bric-a-brac. 11.30-11.55 The selling game. 11.55 Weather. Scotland: 6.00-6.45 Nationwide. Reporting Scotland. 11.32 News, weather. N. Ireland: 6.00-6.45 Nationwide. Scene around six, weather. 11.32 News, weather. Road works report. SW. South, West: 6.00-6.45 Nationwide. Points West. South today. Spotlight SW, weather. 11.32 News, weather. 7.45-8.15 Week in week out. 11.05.

BBC 2

11.00 a.m. PLAY SCHOOL. 7.30 p.m. NEWSROOM, weather. With Peter Woods. 8.00 BEETHOVEN MASTER CLASS. 8.40 LUCK STRANGER. Film of the last coasting barge in Europe working under sail. 9.20 OUT OF THE UNKNOWN. 'Target Generation'. Science-fiction. 10.10 NEWS ON 2, weather. 10.15 WORLD CINEMA. 'Shakespeare Wallah'. With Felicity Kendal, Shashi Kapoor and Madhur Jaffrey. James Ivory's highly-praised film of a group of Shakespearean players in modern India.

ITV

2.05 p.m. Journey of a Lifetime. 2.20 It happened to me. 3.15 National exhibition of children's art. 4.17 Origami. 4.30 Crossroads. 4.55 Flipper. 5.20 Magpie. 5.50 NEWS. 6.02 TODAY. 6.25 PEYTON PLACE. 6.55 FILM. 'Mr Moss'. With Robert Mitchum and Carroll Baker. Gin-swiggering Doctor Joe Moss (Mitchum) sells cur-all tonic to African natives until conned himself by a missionary's daughter. 9.00 THE WORKER. Charlie Drake in the last of his present series. 9.30 THIS WEEK. 10.00 NEWS AT TEN. 10.30 CINEMA. Michael Parkinson's choice. Scenes from 'M*A*S*H', 'Catch 22' and 'Too Late the Hero'. 11.00 THE AVENGERS. 12.00 WHY IT MATTERS. Former TUC secretary and now CIR chairman George Woodcock talks about his Catholicism.

REGIONAL ITV

CHANNELS: 4.00 Puffin's birthday greetings. 4.10 Origami. 4.25 Wendy and me. 4.55 Captain Scarlet. 5.20 London. 6.00 News, weather. 6.10 Cheaters. 6.35 Crossroads. 7.00 Film: 'Finger in the sky'. 9.00 London. 11.00 All our yesterdays. 11.45 Weather. 3.58 News. 4.00 Gus Honeybun. 6.00 Diary. 11.30 Faith for life. 11.35 Weather. SOUTHERN: 3.15 London. 4.00 Houseparty. 4.15 London. 4.55 Forest rangers. 5.20 London. 6.00 Day by day. 6.35 The worker. 7.15 Film: 'Second Chances'. With Robert Mitchum, Jack Palance and Linda Darnell. 8.35 Department 5. 9.30 London. 11.00 News. 11.10 NYPP: 'Fast Gun'. 11.40 Weather. Action '70.

JUST OUT

STALINISM IN BRITAIN

A TROTSKYIST ANALYSIS BY ROBERT BLACK

I would like information about THE SOCIALIST LABOUR LEAGUE

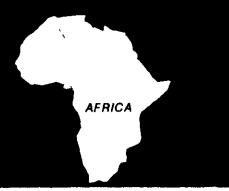
Fill in the form below and send to NATIONAL SECRETARY, SOCIALIST LABOUR LEAGUE, 186A CLAPHAM HIGH ST, LONDON, SW4.

Name _____ Address _____

Other solutions range from praying, as Mr George Clarke recently did, to Communist Party plans to lower interest rates to encourage building and the

CLASS STRUGGLES IN AFRICA

By N. Makanda



ANC and ZAPU receive world church finance

THE WORLD Council of Churches' September decision to give financial donations to the African National Congress of S Africa (ANC), the Zimbabwe African People's Union (ZAPU) of 'Rhodesia' and other 'liberatory' movements in Africa was a tribute to their collaborationist nature.

There was no need for Council to stipulate where or how the money should be used. It will be used for military adventures by the ANC and ZAPU. But these are merely show-pieces of human sacrifice staged by the Liberal-Stalinist ANC leadership to secure Organization of African Unity (OAU) and United Nations support. Lives will again be thrown away to show that the ANC and ZAPU are a 'force'.

Insurance policy

The World Council—especially the United States and W Germany churches—would not have given a donation if it was not certain in advance of the reformist, non-revolutionary nature of the recipients. This assurance has long been provided by the histories of these organizations and by their present associations with im-

perialist agencies, like the OAU, the UN and the World Council of Churches itself. The donations are simply premiums on an insurance policy to guarantee that there is no overthrow of the racist-imperialist regimes, but a rapprochement between reformism and apartheid. It was for the same reason that the World Council backed 'Biafra' and every other dirty and murderous imperialist trick in Africa since and including the murder by the United Nations and Tshombe of Lumumba.

Not independent

The ANC and company are virtually part of the World Council set up through their

collaboration with the Anglican and Catholic churches. As such the decision to hand over cash was hardly an independent one, in which the ANC did not have a hand. Having shown itself a 'good boy' of imperialism, the ANC was due for a reward more substantial than the Nobel Prize awarded to Chief Albert Lutuli, ex-ANC head.

Rome conference

The ANC is not alone from this point of view. Without detracting from the unquestionable courage, heroism and sacrifice of its members and most of its leaders in the field, the Popular Movement for the Liberation of Angola (MPLA) is

fast producing a leadership which is following in the wake of Roberto Holden, leader of the Angola Liberation Front. (The American Central Intelligence Agency approved of Holden as 'non communist' long ago.)

At MPLA's June-July conference in Rome, which, significantly, was backed by the ANC liberal-nationalists of London, its leader, Angostinho Neto, a Protestant, made an appeal to the Pope for the sake of 'greater unity and understanding'.

When interviewed by Basil Davidson ('Sunday Times' August 30, 1970) Neto, leader of a real guerrilla movement (which is much more than can be claimed by the ANC leaders) said that he was willing to get 'western' help.

He was a 'neutralist' in foreign policy. This puts him in the camp of the West, as all 'neutralist' does. Having said this does not mean that it is in any way the right of European or American Social Democracy to criticize the national movements of Africa, or for the genuine socialist movement in Europe and the USA to give anything but unconditional financial, material etc., support to the anti-British, anti-Portuguese, anti-apartheid struggles in Africa.

Struggle

Where there is a struggle there is unconditional support, critical or otherwise. But where there is a political deal with imperialism and apartheid in the offing, it is another question. The MPLA and similar armed bodies are at war with Portugal. All fire to their arms! But the ANC is not at war with apartheid. It is in league with the British Liberals, Anglicans, the World Church Council etc.

It is neither a mass nor a revolutionary movement. ANC victims, like those on trial today, have to receive full financial and material support from British labour. But ANC policy, never. The Popular Front of the ANC and ZAPU with the Liberals, Anglicans and World Council of Churches is an unholy alliance against the oppressed people of S Africa and Rhodesia. It is purely in the interests of a deal with apartheid which can only preserve the cheap labour supply and colossal investments of imperialism, especially of British imperialism, in southern Africa. And now, for a thousand pieces of paper, they are, once again, selling the struggle to imperialism's ecclesiastical minions.



Young factory workers read the Young Socialist paper 'Keep Left'.

SOUTHERN Ireland may be separated from its northern neighbours by boundaries and government, but the youth of both countries face the same consequences of British imperialism's iron heel.

British troops do not patrol Eire's capital, Dublin, as they do in Belfast and Derry, but the Fianna Fail has its anti-trade union laws and its notoriously brutal police force.

The sunny advertisements in the glossy British Sunday magazines invite the reader to travel by Aer Lingus and get away from it all down by some picturesque lake.

But the youth of S Ireland have a different story to tell.

This is no country of pleasant simplicity and pretty scenery, with all the years of the 'troubles' forgotten. The mark of British imperialist repression is the stark reality.

The official unemployment figure of 59,587—about 3 per cent of the population—does not give a true picture of the conditions in S Ireland.

PITIFULLY

Many youth who either cannot find a job or refuse to work for the pitifully low wages offered emigrate to England.

Others, on leaving school, may never have a job—they are not included in the Ministry's figures.

Today the youth in S Ireland find themselves in the centre of a growing militancy on the part of the working class against Lynch's capitalist republican government.

Such an upsurge is personified in the 21-week strike of cement workers for a £7 increase in wages.

Their determination was only finally broken by the actions of the Polish government in exporting cement to Ireland to help break the stoppage.

In the face of such a challenge from the working class the Lynch government faced a serious crisis within its own ranks earlier this year—two ministers were sacked from the government for alleged gun-running.

In the build-up of these events the working-class youth have surged into the forefront and their movement towards political action has been crystallized in the recent launching of the Irish Young Socialists, sister organization to the Young Socialists in this country, which embraces both N and S Ireland.

RESPONSE

Led by YS National Secretary John Simmance, a special recruiting team visited Dublin from Britain to join the Irish Young Socialists in the building of their revolutionary youth movement.

Outside factories and on the housing estates the response they received was enthusiastic.

The young people they spoke to were keen to help build new branches and work towards the YS projected rally in Dublin on September 26, which will be attended by Young Socialists from all over Ireland.

At a plastics factory a group



Young Socialists sister organization in Ireland

of young girls—Kay (16), Tina (14), Ann (15) and Bridgette (15) described typical conditions for youth their age.

Because of the low standard of living, they said, the large majority of young people had to work as soon as they were able—at 14—in order to help make ends meet at home.

VICTIMIZED

One girl showed a wage packet of £2 for four-and-a-half days' work on a job which started at 9 a.m. and ended at 5.30 p.m. with only one break of 15 minutes in the morning and 30 minutes for lunch.

'When you start you are put on piecework. The foreman is constantly looking over your shoulder.

'We have to do seven rolls of plastic a day and sometimes our hands get cut and burnt,' the girls said.

Recently 15 girls were victimized at the factory for asking for trade union organization.

The Young Socialists' team centred most of its recruitment work on an industrial estate on the outskirts of Dublin with thousands of council houses and little else.

Only the Tenants' Association Bingo Hall, with its admission fee of 8s, offers any kind of relief from boredom and frustration.

Coming from these kind of

conditions—dictated through the Lynch government by the exploitation of British imperialism, chief investor in S Ireland—the youth are searching for a solution to the problem which has been with their parents and their grandparents for generations.

The IYS has found a ready response to its political campaigns amongst the working class who are seeking an alternative to the platitudes of reformism and the blind alley of Irish nationalism.

They have reported good sales of their own paper 'Youth Bulletin', as well as the Young Socialists' paper 'Keep Left'.

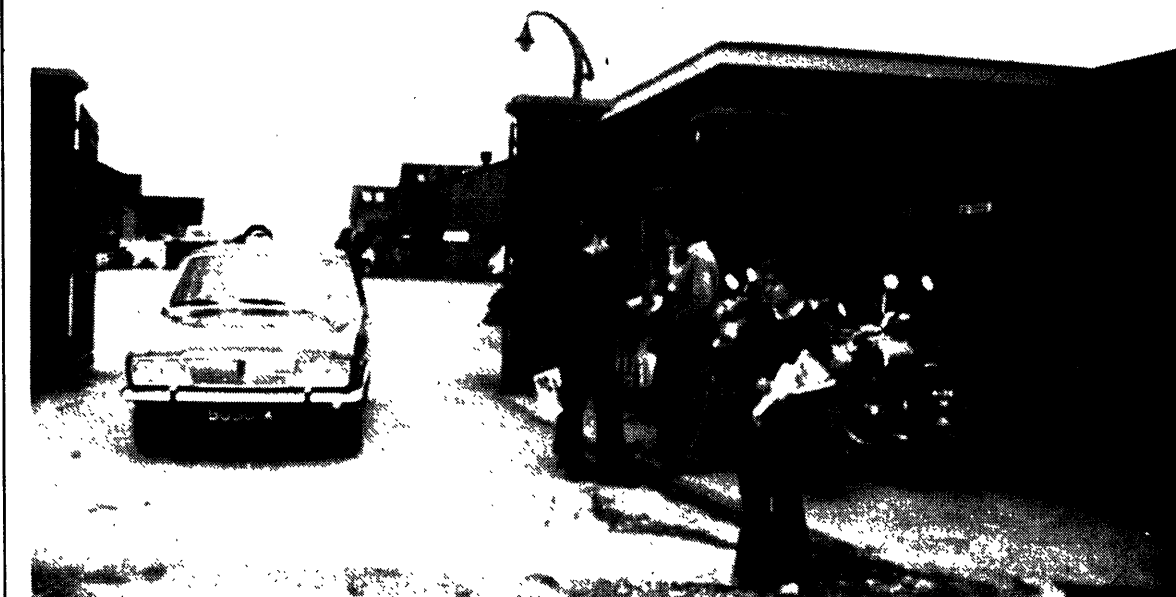
CONFERENCE

They will hold their first conference in January 1971 and campaign around a programme of demands against anti-trade union laws, unemployment and for the nationalization of the basic industries within a unified Irish Socialist Republic.

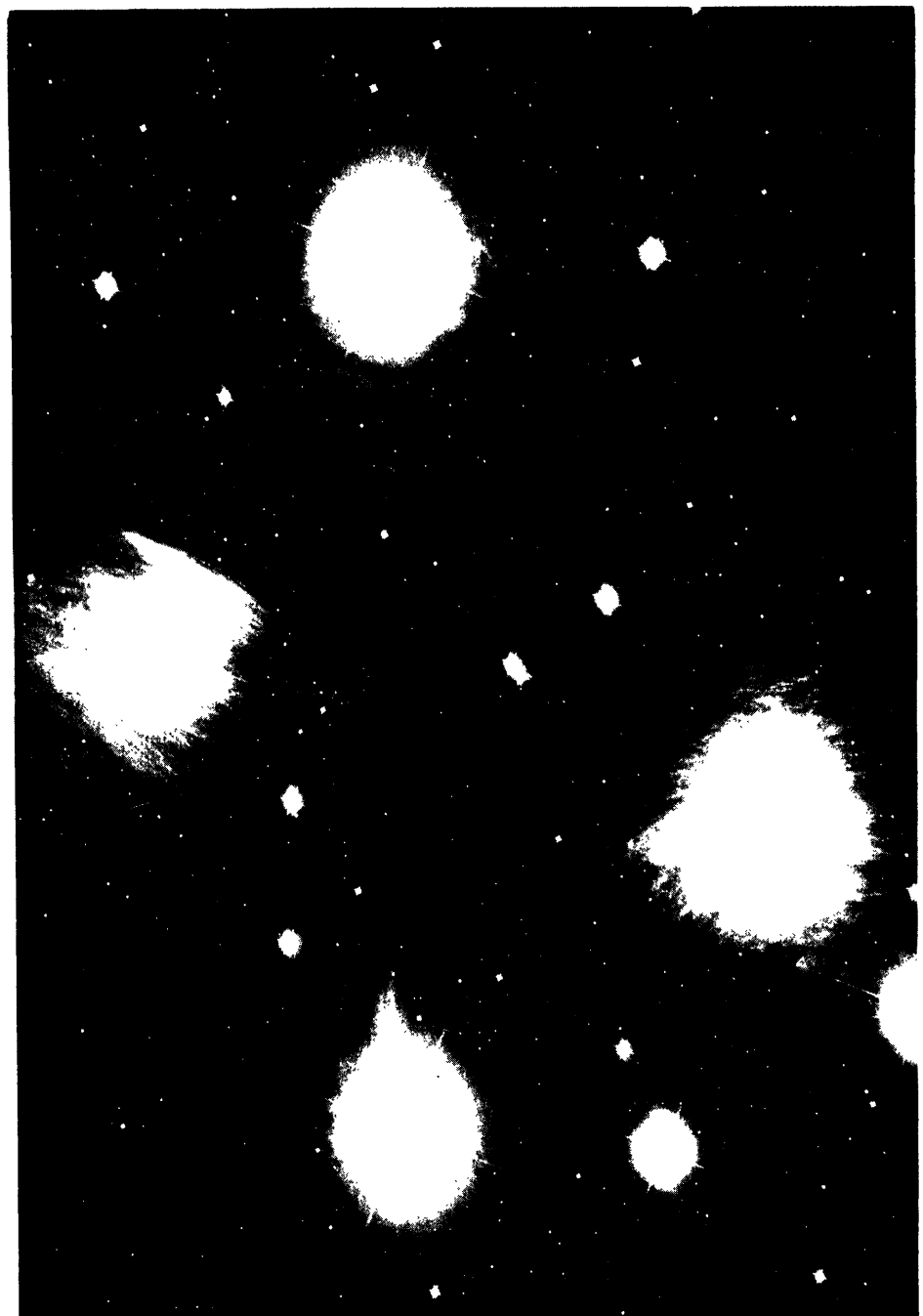
As the only youth movement to oppose the presence of British troops and begin the building of revolutionary leadership to end partition, the IYS fights alongside the British Young Socialists to prepare the working class for the common struggle against the Tories.

In this fight they join hands with the international struggle of Trotskyist youth in the fight for the emancipation of the working class from the yoke of imperialist oppression.

The Young Socialist team recruiting outside a Dublin factory.



YOUTH NEWS EVERY THURSDAY



The Pleiades—a 'galactic' star cluster.

SCIENTIFIC WORLD

Is anybody there?

PART FOUR

from the standpoint of method.

No longer was the solar system God-given, but matter in motion, coming into being over a period of millions of years in a process of change.

At the recent 14th General Assembly of the International Astronomical Union in Brighton, Professor Fred Hoyle took the nebular hypothesis as his starting point and attempted to resolve the angular momentum problem as a material 'sorting out' subordinate to the main process.

MAGNETIC THEORY

Hoyle invokes magnetic theory which, of course, was not developed in Kant's day, and calculates that the necessary distribution could have occurred if a moderate magnetic field has operated over a period of about 10,000 years—a short period in astronomical terms.

However, even where planets exist, the development of life depends on many other factors, not least of which is the nature of the parent star itself.

Putting the stars into some sort of order required a long period of observation and classification. The recognition that the light from a star contained vital information about its constitution was the necessary key that finally opened the door.

Towards the end of the last century, it appeared that stars fell into certain categories according to their spectra (see part 3) and the different types reflected differences in temperature.

The seven main types were classified in order of decreasing temperature by the letters O, B, A, F, G, K, M. Our Sun falls in the G category.

PATTERN

Meanwhile Russell at Princeton and Hertzsprung in Europe came upon another striking pattern.

They found that the overwhelming majority of stars of a particular type had the same inherent brightness (luminosity) and are said to lie on the 'main sequence'.

Summing up their results: if a star lies on the 'main sequence', then the hotter it is, the brighter and larger

it is and the shorter its lifetime.

For example, a B-type star will be about 17 times as heavy as the Sun and five times as hot, whereas an M-type will be about one-third the size and one-third cooler.

The main sequence is the home of a star as long as its fuel is hydrogen which is converted to helium by a continuous thermonuclear ('hydrogen bomb') reaction.

Once a star's internal heat and pressure build up to the point at which the reaction can take place, it moves on to the main sequence and stays there until the hydrogen in the core is exhausted.

BURN UP

The period on the main sequence must be long if life is to develop. The age of the earth is about 4,600 million years, about a third of which passed before the necessary chemicals for life had evolved.

The big stars burn up so fast that some of them stay on the main sequence for only about one million years, whereas the smallest M-types remain there for more than 100,000 million years. Yet these small stars may be too cool to support life on their planets, if any.

During the 1950s, Huang in the United States carried out an investigation into the possibilities of life-bearing planets orbiting the different types of stars and came to the conclusion that the most probable candidates were the smaller F-types, the Gs and the larger Ks.

Fortunately, we fall right in the centre of this range!

In other words, if a star is very hot, it is too short-lived; if too cold, suitable planets could only exist in a very narrow band close to their sun.

Huang's candidates strike a happy medium. In our solar system, Mars lies just within the zone of toleration, as does Venus.

Yet, given a suitable star and the existence of at least one planet within it, there are still further conditions—on the planet itself—which must be satisfied for life to evolve which is in any way similar to that on Earth.

● To be continued.

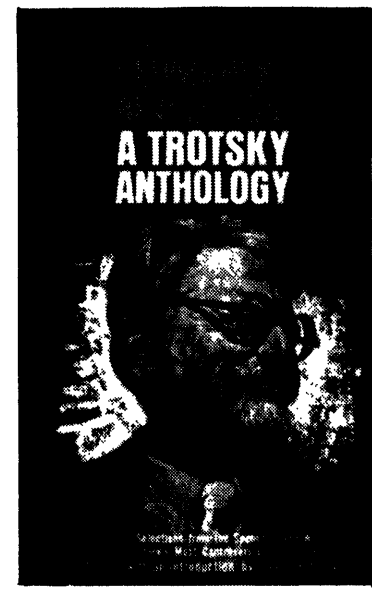
THE EXTENT to which life exists outside our own solar system obviously depends crucially on the frequency with which planetary systems are formed.

The argument about the origin of our solar system rages as fiercely today as it did 200 years ago when the different possibilities were first seriously proposed.

Any plausible account of the system's birth must take into account certain well-established astronomical facts.

The planets all lie close to one plane; they all rotate in the same sense round the Sun;

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LIFE ON OTHER WORLDS by MARTIN ZARROP

although lumped together they have only one thousandth the mass of the Sun, they embody 98 per cent of the angular momentum of the whole system.

These properties tell us something about the origin of the system, because the Sun and its retinue of planets, taken together, are billions of miles from any other massive bodies and can be considered isolated. Under these conditions certain overall properties of the system are conserved throughout its life.

EXAMPLE

Let us take the example of angular momentum.

Roughly, the angular momentum of a body is calculated by multiplying its mass, speed and distance from the centre of rotation.

A satellite orbiting the earth has constant angular momentum and, therefore, when its distance from the earth decreases, its speed increases. Strictly speaking, this is only approximate because of the influence of the Moon, etc.

In 1745, the French naturalist Leclerc suggested that a comet—which he erroneously considered comparable in size to a star—struck the Sun off-centre, started it spinning and tore away matter that became the planets. The possibility of such a

collision is extremely remote and would make the number of planetary systems extremely small.

Later scientists who took up this 'hot' hypothesis and carried out detailed calculations of the outcome of such a 'catastrophe', found great difficulty in keeping the displaced material in solar orbit at all.

In addition, the fact that the temperature involved would be over a million degrees centigrade held out the possibility that the matter would explode rather than condense into planets.

CONDENSED GAS

Ten years after Leclerc, Kant proposed that the whole universe was originally gas that condensed into regions of higher density. One of these became the solar system, which—because of its spin—flattened into a disc. Then, due to gravity, the matter coalesced into the Sun and the different planets.

From the standpoint of explaining all the facts, the 'cold' theory of Kant seemed unable to explain why the planets should have the lion's share of the solar system's angular momentum and this seemed a severe criticism of the 'nebular hypothesis'.

However, Engels in his 'Dialectics of Nature' hails the theory as a big step forward

