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The Economics of Rehabilitation

By A. J. CHEADLE and R. MORGAN

Introduction

The Tunbridge Report on Rehabilitation (1972, para 71) comments on 'the paucity of research on the requirements of rehabilitation and the evaluation of rehabilitative treatment and techniques.' An unusual way of evaluating the effectiveness of rehabilitation is to study its cost.

One such study was conducted by Jones and Sidebotham (1962). They calculated the cost per case and the cost per short-stay patient week in three hospitals. It turned out that the most expensive one per week had the lowest cost per episode of illness. This study confirmed the earlier findings of Wadsworth, Tonge and Barber (1957).

Another ambitious study was the Psychiatric Evaluation Project (PEP) which examined and compared data about 12 V.A. hospitals in the U.S.A. Stumpf (1964) reported that relative effectiveness was correlated negatively with size of hospital and positively with staff-patient ratio; hence the more effective a hospital the more expensive it tended to be. Ullmann (1967) confirmed these findings.

May (1971) compared the costs of five different treatment regimes applied to first-admission schizophrenics. He found that the cheapest treatment, which was drugs alone, was also the one which produced the best clinical result.

McKenzie (1968) attempted to show the benefits both to the National Exchequer and to the individual of having adequate retraining facilities for disabled people living in the community. He estimated that a training course cost about £260. He argued that this small outlay pays for itself many times over in terms of increased individual earnings, increased tax contributions and decreased Social Security Benefits. He concluded 'We owe it both to the disabled and the community at large to spend a good deal more time and effort in establishing an accurate cost benefit analysis of the economics of rehabilitating the disabled.'

In the light of these studies and exhortations we have attempted to analyse the economic consequences of our hospital's efforts over 10 years to rehabilitate its first 200 patients.

Description of the hospital

St. Wulstan's Hospital opened in November 1961, and has been described at length by Morgan, Cushing and Manton (1965). It serves as a rehabilitation unit for long-stay patients selected and transferred from other mental hospitals in the Birmingham Region of the National Health Service. The regime is highly structured, especially on week-days, and much emphasis is placed on patients' responsibilities to the work programme, to communal ward life and to themselves. In their leisure time they are officially free to do as they choose.

The hospital has four doctors and usually about 75 nurses. The in-patient population has ranged from 180 to 235 at different times. Since 1964 there has also grown up an increasing population of day-patients whose number reached 75 at the end of 1970; these are all former in-patients now living in lodgings in the local town and commuting to sheltered work at the hospital. There is little doubt that the numbers of doctors and nurses amount to a more generous allocation than was known to any of the patients in their parent hospitals, especially as most of them came from comparatively under-staffed long-stay wards. The mean length of stay in the parent hospital before transfer was about ten years. Some patients, of course, do not do well after transfer, and the right is exercised (always reluctantly and belatedly) to return these to their parent hospital.

The cost per week of maintaining a patient in this hospital has remained considerably higher than the equivalent cost in an average

parent hospital. However the disparity in costs has narrowed considerably.

(The 1961 figure in Table I should be dis-

TABLE I
Weekly maintenance cost at St. Wulstan's Hospital and parent hospitals

Year	St. Wulstan's Hospital	Parent hospitals			Day-patient total cost
		Lowest	Median	Highest	
	£	£	£	£	£
1961	(62.34)	6.24	8.37	10.34	—
1962	17.21	6.52	8.84	11.49	—
1963	17.54	6.81	9.52	12.15	11.00
1964	18.57	7.39	10.53	13.70	11.00
1965	20.25	8.51	11.46	15.65	11.50
1966	21.01	9.58	12.44	16.82	11.50
1967	21.55	10.44	13.40	17.92	12.00
1968	24.45	11.59	15.23	19.45	12.50
1969	25.88	13.09	17.06	21.74	12.50
1970	29.72	15.57	20.80	25.91	12.50

(Figures obtained from Regional Costing Booklet referring to financial year and adjusted to refer to calendar years.)

regarded—it is artificially high because of the very small number of patients admitted). Whereas in 1962 St. Wulstan's cost almost twice as much as the median parent hospital, by 1970 it was costing only 43 per cent more. This is presumably because over the years parent hospital patient populations have fallen and staff ratios have improved.

Community facilities were scanty in 1961 and little better in 1970. Some hostels exist, but the patients' needs have been suited better by lodgings, and our community nurses have always been able to find these. Thus the resettlement of a patient has never been prevented by the lack of somewhere to live (Payne, 1972).

No sheltered work in the community was accessible to our patients until 1967, when the Birmingham Industrial Therapy Association opened its doors to all comers. A small number of patients have been referred there on discharge.

METHOD OF STUDY

Our aim has been to measure the true cost to the national economy of psychiatric rehabilitation.

The first 200 consecutive admissions to the hospital appeared to form the most suitable cohort to study, for several reasons. As the first to be admitted they could be followed up for the longest period. They were admitted in groups of 7–10 per week over a period of six months starting in November 1961 when the hospital opened; this period is so short that for certain purposes they could be considered to have been admitted all at the same time; by contrast any subsequent cohort of the same size took about three years to arrive here. Also, unlike any subsequent cohort, the first 200 patients were deliberately selected to include a wide range of chronicity and clinical deterioration; they did not include only those whose prospects appeared to be best. The choice of this cohort for the study will therefore yield an unfairly bad picture of the hospital's overall success rate. Its wide range will, however, yield prognostic data which we hope to present in a subsequent paper.

The cohort was made up as follows:

Sex:
- Men 116
- Women 84

Number of previous admissions:
- 1 69
- 2 54
- 3 36
- 4 16
- 5 17
- 6+ 8

Diagnosis:
- Schizophrenia 164
- Affective psychosis 3
- Inadequate personality 9
- Mental subnormality 7
- Schizophrenia and mental subnormality 5
- Schizo-affective psychosis 5
- Organic psychosis 7

Wing group (schizophrenics only) (Wing 1961):
- 1A 36
- 1B 58
- 1C 40
- 2 15
- 3 7
- 4 5
- 5 3

Social withdrawal score (Wing, 1961):
- 0 71
- 1 22
- 2 25
- 3 16
- 4 19
- 5 24
- 6+ 23

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	Range	Mean	S.D.
Age on first admission to mental hospital	16– 49	28·4	7·0
Length of total stay in mental hospitals (years)	1– 36	11·2	6·7
Length of current stay in parent hospital (years)	1– 36	10·2	7· 4
Age on transfer here from parent hospital	22– 57	42·0	7·7
IQ (WAIS full scale score)	50–123	820	19·0

	Men £	Women £
1961	7.74	6.83
1962	8.24	7.04
1963	8.49	7.39
1964	8.52	7.73
1965	9.22	8.09
1966	9.92	8.59
1967	10.42	8.83
1968	10.87	9.42
1969	12.00	10.75
1970	12.92	11.50

Although a wealth of follow-up data about discharged patients was to be found in their St. Wulstan's case notes, including much information about subsequent employment, these inevitably lacked the complete detail that we required for the whole period, and they were not used. Instead we were able to obtain from the Records Department of the Social Security Division of the Department of Health and Social Security confidential and comprehensive information on the contributions and credits over the period 1961–70 of all those patients who had ever worked in open employment during those years. From this priceless information it was possible to construct in the case of each discharged patient a week by week record of the number of weeks worked (which was implied by the fact that the employee's National Insurance contribution had been paid), the number of weeks off sick (implied by the drawing of Sickness Benefit) and the number of weeks unemployed (implied by the drawing of Unemployment Benefit).

We would have liked the same accurate data on the amount of income tax paid by the sample, but after many enquiries it became obvious that we would not get them. We therefore had to resort to some kind of informed estimate. In the case of any patient in open employment we assumed a notional figure for weekly earnings. The experience of one of us (A.J.C.) of working for four years as a social worker at the hospital from 1966–69 inclusive (Cheadle, 1970) was of value here in providing first hand knowledge of the level of jobs which ex-patients did. We consulted the British Labour Stati Historical Abstract (Department of Employ t, 1969) to find the most typical and representa wage for each year for doing a job of an unskilled nature. These rates were then used as the notional earnings of all patients in open employment, follows:

They amount deliberately to a slight underestimate of patients' earnings, and they are basic rates which take no account of overtime. We knew that none of these patients had any dependent relatives. We further assumed, and this is almost certainly true, that none of them was entitled to any allowances apart from Personal and Earned Income Allowances. The annually applicable rates of tax and allowances were obtained from the Annual Abstract of Statistics (Central Statistical Office, 1971), and each patient's tax contribution was then calculated, taking into account any periods of sickness or unemployment.

There were 57 patients who had been returned to their parent hospital and another 15 who had reached there by other routes, or were in some other hospital or institution. We obtained up-to-date information on these by writing to the hospitals concerned.

The 125 patients in the sample who were entitled to Sickness Benefit had been drawing it long enough for the weekly amount payable to have been reduced to the basic rate. This altered during the period under review as follows:

1961–65	£0.57½
1965–70	£0.80
1970	£1.00

The exact amount to which each patient was entitled has been calculated and debited to his or her account in our study.

In February 1971, Britain changed to decimal currency, and we have therefore expressed all money in terms of this conversion. For the sake of clarity we have used the calendar year as the basis for all annual calculations, when necessary converting raw data from all the other varieties of year that are in use.

The costs of maintaining a patient in any hospital in the Region were readily obtained from the Regional Costing Booklet. For day-patients the official cost per attendance at hospital was obtained from the same source, and we assumed that they all attended

five days a week. Day-patients were also in receipt of Sickness Benefit payments or Supplementary Allowances, or both, and these were included in our costs.

All follow-up and care in the community during the relevant period were supplied by nurses employed by the hospital, acting in the role of social worker. This means that these costs have already been accounted for in the in-patients' bill. This results in a slight but inevitable over-estimate of the total cost of in-patients, but it means that there are no further hidden costs in the day-patient sector.

Using the financial ingredients already described, an individual statement of each patient's 'account' was constructed year by year for the years 1961–70 inclusive. Each statement contained a debit and a credit side. Simple addition of the annual figures yielded the ten-year cost. Subtraction of the credit figure from the debit figure gave the net cost. Addition of the individual costs of the 200 patients gave the cost of the whole cohort.

Results

By the end of 1970, 82 of the 200 patients were successfully resettled in the community, 14 were also living out of hospital but attending as day-patients, 69 had returned to their parent hospitals as failures, and only 19 still remained undergoing rehabilitation; 12 of these had been in-patients here throughout. Altogether 44 of the 200 patients were day-patients at some stage in their rehabilitation; for some of them it was a stepping stone to subsequent full discharge, for others it was the peak of their achievement. During the ten year period 109 patients (54·5 per cent of the sample) achieved full discharge, but each year a proportion relapsed and had to be readmitted. Most of those who were readmitted were later discharged a second time, and indeed in some cases a third, fourth, fifth or sixth time. At the end of 1970, there were 27 patients who had been out but were back in hospital; of the 82 who were out, 52 were people who had needed only one discharge, while the other 30 had needed more than one.

Fifty-seven patients had been discharged by the end of their second year, of whom 7 had been readmitted. It should be noted, however, that substantial proportions of the cohort were not ready for discharge until their third year (26 patients) or fourth year (14 patients) of rehabilitation. Of the 109 who were going to achieve discharge, 97 (89 per cent) had achieved it by the end of the first four years, while only the remaining 12 achieved it during the second four years.

One patient was repatriated to Sierra Leone. Three patients died while still in-patients here. A further 12 had died between the time they left here and the end of 1970; 8 of these died in the community and 4 in their parent hospital.

We will confine ourselves to this general outline of the careers of our 200 patients. Any attempt to sort them into any more detailed categories at once comes up against the multitude of different patterns that they described, which almost dictate a separate category for each single patient.

We will accordingly express the remainder of our findings in financial terms. For convenience these are arranged according to the locations of the patients.

In Table II are collected together the annual costs of members of the sample while they were in-patients or day-patients of this hospital. The bill covers a period of 9 years and 5 weeks and amounts to £794,934.

Table II
Costs incurred by sample at St. Wulstan's Hospital

Year	In-patients		Day-patients total costs	Total
	Hospital care	Sickness benefit		
	£	£	£	£
1961	6,732.72	53.47	—	6,786.19
1962	195,339.16	3,019.33	—	198,358.49
1963	138,653.70	3,333.82	110.00	142,097.52
1964	106,127.55	2,471.18	1,408.00	110,006.73
1965	76,585.50	2,014.40	3,726.00	82,325.90
1966	60,760.92	1,588.80	5,681.00	68,030.72
1967	50,513.20	1,327.20	4,632.00	56,472.40
1968	44,401.20	1,217.70	4,687.50	50,306.40
1969	32,142.96	891.00	7,500.00	40,533.96
1970	31,414.04	814.00	7,787.50	40,015.54
Total	742,670.95	16,730.90	35,532.00	794,933.85

Similarly in Table III are collected together the annual costs of members of the sample while they were in-patients in their parent hospital (or other hospital). Our decision to begin the ten-year survey period at the beginning of 1961

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TABLE III
Costs incurred by sample in parent and other hospitals

Year	In-patients: Hospital care	In-patients: Sickness benefit	Day-patients total costs	Total
	£	£	£	£
1961	85,351.88	3,684.02	—	89,035.90
1962	15,074.34	569.25	—	15,643.59
1963	3,754.33	145.80	—	3,900.13
1964	10,627.92	432.00	—	11,059.92
1965	23,283.28	956.00	—	24,239.28
1966	29,958.73	1,152.00	92.00	31,202.73
1967	40,089.21	1,326.40	1,164.00	42,579.61
1968	45,180.62	1,540.80	1,950.00	48,671.42
1969	52,506.33	1,577.70	2,675.00	56,759.03
1970	65,267.69	1,796.00	3,050.00	70,133.69
Total	371,094.33	13,179.97	8,931.00	393,205.30

means that all the sample numbers are costed to their parent hospitals for a period of 11–17 months up to the time of their transfer to this rehabilitation hospital. Thereafter parent hospital costs are incurred only by those patients who were returned to their parent hospital as failures. The total amounts to £393,205.

Table IV lists the annual costs incurred by ex-patients in the community. Here are included the costs of periods of unemployment or

TABLE IV
Costs incurred by ex-patients unemployed in the community

Year	Cost
	£
1961 ..	—
1962 ..	1,266.00
1963 ..	6,036.00
1964 ..	7,848.00
1965 ..	9,932.00
1966 ..	10,543.00
1967 ..	12,467.00
1968 ..	17,040.00
1969 ..	16,897.50
1970 ..	19,567.50
Total ..	101,597.00

sickness suffered by any of the discharged patients. They amount to £101,597.

By contrast, Table V shows the annual contributions to the national economy of the discharged patients at times when they were in work and therefore contributing. These amount in total to £20,825. The fact that the costs amount to five times as much as the contributions, may mislead the reader into thinking that the majority of ex-patients had achieved and been granted their discharge to no better purpose than to spend their lives in the community

TABLE V
Contributions made by patients employed in the community

Year	Income tax: In-patients	Income tax: Ex-patients	N.H.I.: In-patients	N.H.I.: Ex-patients	Graduated pensions: In-patients	Graduated pensions: Ex-patients	Total
	£	£	£	£	£	£	£
1962 ..		18.26		78.45			96.71
1963 ..		104.91	112.62	487.86			705.39
1964 ..		374.79	129.72	1,098.02			1,602.53
1965 ..	34.70	814.01	184.75	1,584.52	2.56	14.87	2,635.41
1966 ..	66.45	1,029.82	140.15	1,713.41	4.71	65.08	3,019.62
7 ..	75.20	1,142.40	114.53	1,556.87	7.26	91.32	2,987.58
3 ..	5.05	942.14	8.22	1,719.22	0.75	131.20	2,806.58
) ..		1,568.57		1,889.55		259.47	3,717.59
1970 ..		1,262.16	3.52	1,659.09		329.07	3,253.84
Total ..	181.40	7,257.06	693.51	11,786.99	15.28	891.01	20,825.25

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either idle or sick. This was not so. It is rather that the direct costs of unemployment or sickness are high, while the direct financial contributions resulting from employment are comparatively low. (We make no attempt to compute the indirect costs or contributions in the manner essayed by Rashi Fein (1958). In fact, out of 31,878 patient-weeks lived in the community by members of our sample, 14,590 patient-weeks were spent in unemployment or sickness while 17,288 patient-weeks were occupied in open employment.

Table VI summarizes the totals of Tables II–V and shows that the net direct costs to the national economy incurred by the 200 patients over 10 years was a little over £1¼ million. This represents approximately £634 per patient per year or a little over £12 per patient per week.

TABLE VI
Summary of costs incurred and contributions made by patients

	£
Total costs incurred at St. Wulstan's Hospital (from Table II)	794,933.85
Total costs incurred in parent hospitals (from Table III)	393,205.30
Total costs incurred in the community (from Table IV)	101,597.00
Total gross costs	1,289,736.15
Less contributions made by patients (from Table V)	20,825.25
Total net costs	1,268,910.90

Such average figures would mean little enough anyway, but they mean even less from the fact that they relate to a period of cost-inflation during which the value of the £ was depreciating annually. The rate at which it did so is shown in Table VII, which also contains the annual net costs of the sample, both in raw form and adjusted in terms of the 1961 value of the £. These costs have fallen consistently year after year but most spectacularly in the first 4–5 years.

The cheapest patient cost £497 net; she was admitted in March 1962, was discharged in June 1962 and has remained out of hospital and in open employment ever since (the major part of the cost of this patient was incurred in the 14 months in her parent hospital before transfer). The most expensive patient cost £11,538; he was the first patient to be admitted in 1961, he has been in this hospital continuously ever since and he draws Sickness Benefit.

TABLE VII
Annual net costs of the 200 patient sample

Year	Net cost	Conversion factor to obtain constant value of £*	Net cost at 1961 value of £
	£		£
1961	95,822	1·00	95,822
1962	215,171	0·96	206,564
1963	151,328	0·94	142,248
1964	127,312	0·92	117,127
1965	113,862	0·88	100,199
1966	106,757	0·84	89,676
1967	108,531	0·82	88,995
1968	113,211	0·78	88,305
1969	110,473	0·74	81,749
1970	126,443	0·71	89,775
Total	1,268,910		1,100,460

* Obtained from *Whitaker's Almanack* for 1973, p. 1194 which quotes 1963 as the base year—we have converted the figures to make the base year 1961 for the sake of clarity.

DISCUSSION

This study has sought to compute the direct cost to the national economy of attempting to rehabilitate, in a unique Regional rehabilitation hospital, a cohort of patients consisting of the hospital's first 200 consecutive admissions. All of them had failed to achieve discharge in the treatment setting to which they had been exposed. To that extent they could all be called other hospitals' failures. Only 100 of the patients retained an ambition to leave hospital; the attitudes of the other 100 had become distorted with time, and 47 of them had reached a state of mind in which from choice they would have remained in hospital for the rest of their lives.

A number were actively psychotic despite medication, a great many were untidy in appearance, unused to looking after themselves and unaccustomed to having any personal possessions to look after (Morgan and Cushing,

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1966). Yet there were very few whose habits and behaviour had deteriorated to the extent that they were incontinent or otherwise completely self-neglectful. Most of them, in other words, had retained some assets which it was possible to work on.

Specialized rehabilitation facilities have helped 54 per cent of the cohort to achieve discharge from hospital. Of these only about half (i.e. 26 per cent of the cohort) have stayed out of hospital continuously since their first discharge. The remainder (57 in number) relapsed and were readmitted. Some did this within days of their first discharge, others only after years outside. By the end of the period under review 27 of them were back in hospital but 30 were out, many only after repeated attempts before they succeeded.

Psychiatric rehabilitation is a long process. Faulty habits and attitudes, if they are amenable to change at all, take a long time to correct. The number of sustained discharges continued to climb for four years before it began to level out. Even after that a further 12 patients reached the point of their first discharge. After 8 years there were no further discharges, and it is unlikely there will be more than 2 or 3 more.

The period between 1961 and about 1966 was a time of full employment in the West Midlands of England. Jobs were quite easy to get, and employers tended, in face of the labour shortage, to be tolerant towards the employees they had engaged. From about 1966 until the end of the decade unemployment rose, and jobs became harder to get and keep. We believe this factor has a bearing on resettlement results and merits further study.

It is usually considered that boarding patients out is cheaper than keeping them in hospital. Parry Jones, Buchan and Beasley (1970) described ten years experience of boarding out mentally disordered patients in Somerset. They pointed out that there are hidden costs which have never been calculated. They concluded, 'Boa " ıg out may well be slightly cheaper than hosp care, but our impression is that there is n . lot in it.' Our estimate of how much our day-patients cost is comprehensive if only approximate. The figures are quoted in Table I, t interpretation of them is difficult. The cost of hospital in-patient care increased dramatically in the years 1963–70. It has always been substantially cheaper to be a day-patient in Malvern than an in-patient at St. Wulstan's, or an in-patient at the most expensive parent hospital. On the other hand the median parent hospital became more expensive than day care in Malvern only from 1966 onwards, and the cheapest parent hospital only from 1969 onwards.

The figures which we have used vary in accuracy. They fall into three groups: (a) Some of the figures are exact, e.g. Sickness Benefit, (b) Others are official averages, e.g. weekly maintenance costs in hospital; (c) The remainder are informed estimates, e.g. Income Tax.

We have calculated and quoted above the absolute cost of the rehabilitation of this cohort. We must now attempt a comparison with the cost of more conventional care. We do not have a control group. We did form one in 1961, and it remained in being in the parent hospitals until 1963 when its members were released from their role in the experiment and a number were transferred here in their turn. At the time it was felt that two years was long enough for both control and experimental group outcomes to have declared themselves. Later experience has shown that two years was far too short, which is unfortunate for our present purpose.

The best we can do, in the absence of a control group, to provide any basis for comparison of our cohort's actual costs is to state what they would have cost in other circumstances. If they had all been transferred here but we had failed to resettle any of them, then allowing for entitlement to Sickness Benefit and for the deaths that occurred, they would have cost £2,128,398. Had they all remained in their parent hospitals instead of coming here and had none of them been discharged, then making the same allowances for benefits and deaths they would have cost £1,350,769. Obviously, some would have been discharged and the cost would have been less, but we have no means of knowing how many or how much less. In reality they cost £1,268,910 which amounts to a 40·3 per cent saving on the cost of keeping

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them all here, and a 6·1 per cent saving on the cost of keeping them all in their parent hospitals.

We will confine ourselves to presenting these figures of retrospective costs based on what actually happened, and we will refrain from indulging in any sophisticated projections into the future. But we cannot refrain from mentioning the following facts. At the end of our ten year study 92·5 per cent of our cohort of patients were still alive. They suffer from conditions which do not shorten life. Care of the chronically ill is so expensive, not because unit costs are high, but because the need for care continues for such a very long time. Therefore every successful discharge of a long-stay patient carries a cost benefit which extends into the future far beyond the limits of a ten year study. By the end of our study only 44 per cent of our cohort of 200 people were still hospital in-patients; 48 per cent of the cohort had been enabled to lead lives of varying degrees of independence in the community.

In the recent words of Moores (1973): 'There are viable economic arguments for putting additional resources into well-organized therapeutic programmes. These relate to the fact that money spent now in making a patient less dependent will result in savings in the future many times greater than this initial investment.'

Summary

The total cost of a psychiatric rehabilitation service for long-stay patients has been measured by studying the hospital's first 200 consecutively admitted patients and their careers over the ten years 1961–70.

Account has been taken of every known direct cost to the national economy, of which the Health Service cost is only a part. Account has also been taken of every known direct financial contribution to the economy by successfully resettled patients. No attempt has been made to include indirect costs or contributions.

The maintenance cost in the rehabilitation hospital was about 70 per cent higher throughout the period than the average cost in the hospitals from which the patients came. Despite this, the total net cost of the cohort under rehabilitation was 6 per cent less than it would have cost to keep all 200 patients throughout the ten years in their previous hospitals.

The extent to which the cost of additional resources has already been offset by some of the patients' success in achieving an independent life has therefore been demonstrated. The trend is likely to continue. All 200 persons who are the subjects of this study entered the decade under review as long-stay patients. Of these, 82 enter the subsequent decade as independent citizens. Their continuing independence is not only gratifying clinically but promises to offset even further the cost of the original investment in an additional rehabilitation service.

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